North Carolina
Department of
Health and Human Services

DIVISION OF INFORMATION RESOURCE MANAGEMENT

SYSTEM DEVELOPMENT LIFE CYCLE

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Version History

Version and Date	Version Description	Author
Version 2 5/08/2014	Revised to address all DIRM production incident (i.e., problem/interrupt), maintenance, enhancement, and new development efforts.	Arun Kumar Lucy Cornelius Tom Reeher Joyce Young Danielle Brady
Version 2.1 7/31/2014	Revised to address comments and feedback received during the DIRM comment period.	Sheri Botts Joyce Young

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1. INTRODUCTION

This document describes a revised standardized System Development Life Cycle (SDLC) process for all steps of any incident (i.e., problem/interrupt) resolution, maintenance, or enhancement effort undertaken for a Division of Information Resource Management (DIRM) supported production application, system, and/or applications-related solution (collectively referred to as "solution"). The DIRM SDLC also applies to new development undertaken by DIRM. How the DIRM SDLC applies to the effort depends on effort type, size (cost/hours), and the level of risk determined for the effort. There may also be additional requirements if any effort is subject to the State Chief Information Officer's (SCIO) project portfolio management (PPM) process (i.e., Senate Bill 991 (SB991)), and Department of Health and Human Services (DHHS) Information Technology Governance Committee (ITGC). As part of the DIRM SDLC and unless otherwise noted, DIRM Application Management teams are required to save all documentation, work products, test results (screen shots, reports, scanned hardcopy test results with or without additional notes recorded on them, etc.), and other critical scanned documents such as signatures in the archive designated for the solution/effort.

The DIRM SDLC identifies the processes and activities that ensure that:

1. the solutions DIRM develops and supports align with the department's mission and support its business needs; and
2. DIRM continues to deliver high quality solutions and support services.

1.1 Document Structure

This document is organized into the following sections:

1. Introduction: Describes the purpose of the document and gives an overview of the document structure.

2. DIRM SDLC Overview: Describes at a high-level the DIRM SDLC process, steps, and activities.

3. Production Incident Resolution: Describes the specific steps, activities, and deliverables required for an effort classified as an incident (i.e., problem/interrupt) resolution for a production solution.

4. Maintenance: Describes the specific steps, activities, and deliverables required for an effort classified as major or minor maintenance for a production solution.

5. Enhancement: Describes the specific steps, activities, and deliverables required for an effort classified as major or minor enhancement for a production solution.

6. New Development: Describes the specific steps, activities, and deliverables required for an effort classified as major or minor new development.

Appendix A: Abbreviations and Acronyms: Defines abbreviations and acronyms used in this document.

Appendix B: DIRM SDLC Effort Types: Defines the types of solution development and support efforts that are required to comply with the DIRM SDLC.

Appendix C: Monitor and Control Activities: Describes the ongoing activities that span the entire life cycle of the effort (i.e., Request through Implement).

Appendix D: Configuration Management Process: Describes the process used to manage the coding process for changes to a production solution and new development.

Appendix E: SDLC Deliverables: Provides a list of all DIRM SDLC required deliverables by effort type.

2. DIRM SDLC OVERVIEW

2.1 DIRM SDLC Scope

The DIRM SDLC describes the standardized process and provides templates for documentation that are required for all applications/systems related solution development and support efforts. Specifically, the DIRM SDLC addresses all incident (i.e., problem/interrupt) resolution, maintenance, and enhancement efforts for DIRM supported production solutions (i.e., in-house custom developed and commercial-off-the-shelf (COTS) product based), as well as DIRM new development efforts that result in the implementation of a new solution related to applications or information systems. See Appendix B for definitions of these types of efforts.

NOTE:

New development efforts are subject as appropriate to both the DHHS ITGC approval process and the SCIO's PPM process (SB991). Enhancement efforts may also need to adhere to SB991 requirements.

2.2 DIRM SDLC Process Overview

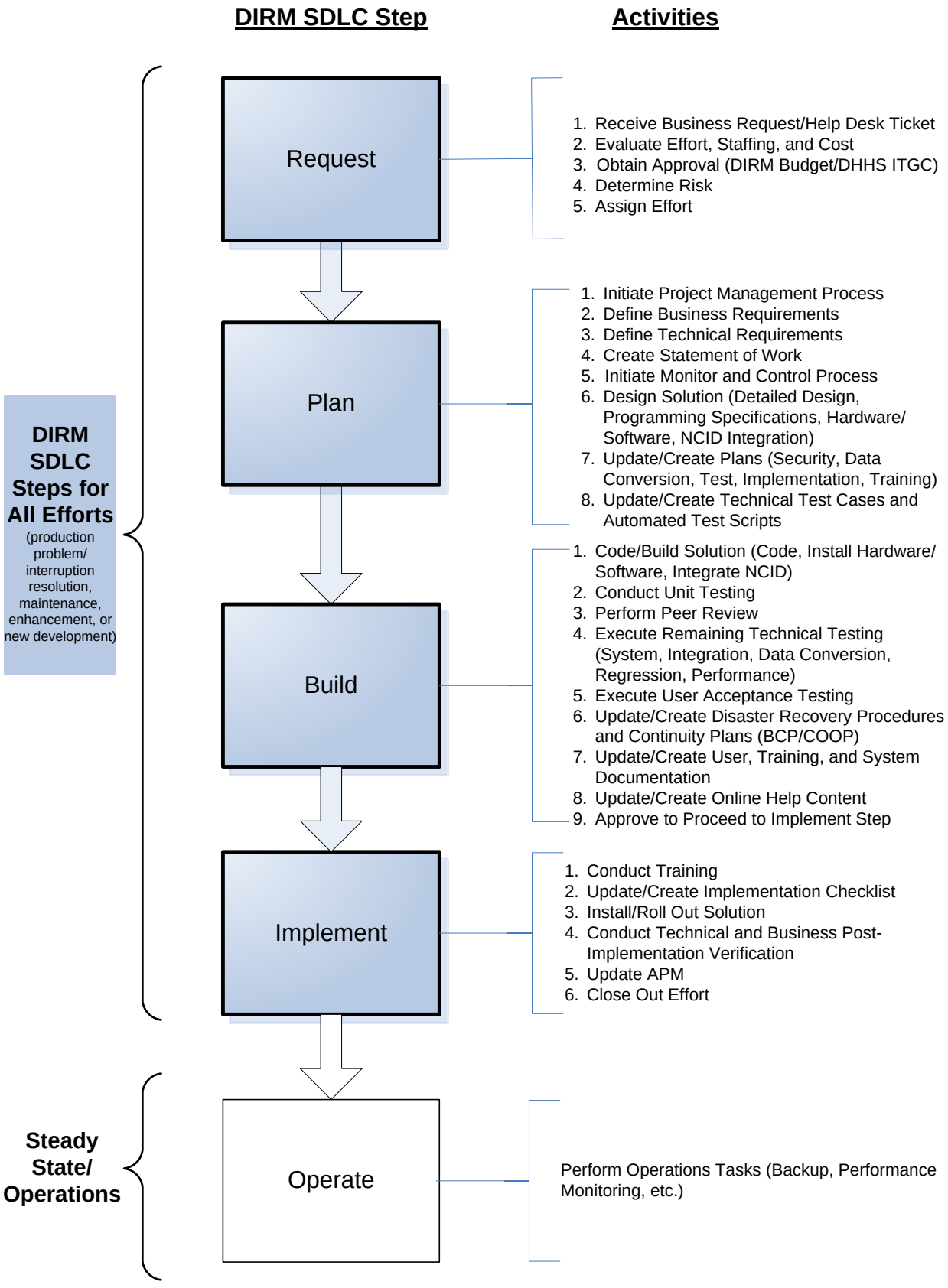
The DIRM SDLC consists of five steps:

- **Request** – Receive; approve; and evaluate effort for effort type classification, size (hours/cost), and risk level; and assign to DIRM Applications Management Team.
- **Plan** – Define Statement of Work; initiate monitoring and control activities; gather and analyze requirements; develop plans needed to implement the solution; and design the solution.
- **Build** – Build and test the solution; and update/create user, technical, and disaster recovery/business continuity documentation.
- **Implement** – Conduct training, update/create implementation checklist; install solution; update state Application Portfolio Management (APM) tool; and close out effort by resolving the ticket, archiving documentation, and conducting lessons learned as appropriate.
- **Operate** – Conduct ongoing operations for solution.

Unless otherwise noted, documentation, signatures, and work products from all DIRM SDLC Steps must be saved in the archive designated for the solution/effort to provide an audit trail for changes to or development of a production solution. Unless otherwise stated, the templates provided with the SDLC must be used to create the deliverables listed in this document; however, additional documentation can be created as necessary to accomplish an effort.

Figure 1 below provides a flowchart overview of the DIRM SDLC steps. Note that the first four steps in the flow have been shaded in blue to indicate that these steps govern all activities undertaken to address an incident (i.e., problem/interrupt) resolution, maintenance, enhancement, or new development effort. Once the effort has been completed (i.e., the resulting solution that has been approved by the business and put into production), the effort is closed out and the Operate step begins where tasks are performed for steady state/ongoing operations. The cycle is repeated for each request related to the production solution or for new development by DIRM.

Figure 1. DIRM SDLC Flowchart



The DIRM SDLC steps are carried out using the "waterfall" development methodology where the activities of one step are completed before entering another step. However, some activities within each step may vary depending on type of effort, size, and level of risk, and activities may be completed in parallel. The DIRM SDLC steps may be adapted to an iterative, spiral, or Agile development methodology if approved by the DIRM IT Director of Applications Management.

The following subsections summarize the core activities that occur within each DIRM SDLC step. The specific requirements for each effort will vary depending on the effort type and level of risk. Details of how the DIRM SDLC applies to each effort type are provided in Sections 3-6.

2.2.1 Request Step

The major activities performed during the Request Step are as follows. Unless otherwise noted, all documentation, signatures, and work products from the Request Step must be saved in the archive designated for the solution/effort.

1. **Receive Business Request/Help Desk Ticket**
   A production incident (i.e., problem/interrupt) is reported by business or technical staff, or the Business Owner submits a request for a production solution or the development of a new solution. Business requests for efforts are to be documented, received, approved and routed as follows:

Effort Type	Request Method
Production Incident Resolution	• Business/Technical Requester opens ticket with the appropriate help desk (typically the DHHS Customer Support Center (CSC)) unless a help desk has been established for specific solution). Documentation describing the incident may be attached. • Help desk assigns ticket to designated DIRM Applications Management IT Manager ("DIRM IT Manager"), DIRM Technical Lead, or staff on call for that solution.
Maintenance	• Business/Technical Requester opens ticket with the appropriate help desk. Documentation describing the request may be attached. • Help desk assigns ticket to designated DIRM IT Manager or DIRM Technical Lead for that solution. – If Business Owners request maintenance through another process, the DIRM IT Manager or DIRM Technical Lead for the solution must open a ticket with the appropriate help desk.
Enhancement	• Business Requester documents request on the DIRM Enhancement Request Form, signs the form, and obtains signatures from the Division Director and Division Budget Officer. • Designated Business Requester (per the list sent to DIRM by the business Division Director) or receiving technical staff (i.e., if form is received via another mechanism) sends form to the appropriate help desk to open a ticket. • Help desk assigns ticket to designated DIRM IT Manager or his/her DIRM Technical Lead for that solution.

Effort Type	Request Method
New Development (DIRM)	• Business requestor works with supporting IT Director/Manager(s) to prepare the proposal and budget using the DHHS ITGC forms located at http://www.ncdhhs.gov/budgetandanalysis/itgovernance.htm. The DIRM IT Manager supporting the business requester can provide assistance upon request. • Proceed to the *Identify Estimated IT Infrastructure Impacts* bullet in the **2. Evaluate Effort, Staffing and Cost** activity.

The incident tracking system used by the help desk stores ticket data; it is not required to download a copy of the help desk ticket to the archive designated for the solution/effort. However, the ticket number will be referenced in the documentation produced for the effort such as the Statement of Work.

2. Evaluate Effort, Staffing and Cost

- *Verify Request Classification* (see Appendix B for definitions of these types of efforts).
  a. Production incident (i.e., problem/interrupt) resolution: Verified by DIRM IT Manager, DIRM Technical Lead, or support staff on call.
  b. Maintenance: DIRM IT Manager/DIRM Technical Lead reviews maintenance request to ensure it is appropriately classified.
  c. Enhancement: DIRM IT Manager/DIRM Technical Lead reviews enhancement request to ensure it is appropriately classified.
  d. New Development: Not applicable; classification of enhancement efforts occurs as part of the **1. Receive Business Request/Help Desk Ticket** activity.
- *Identify Estimated IT Infrastructure Impacts*
  a. Production incident (i.e., problem/interrupt) resolution: DIRM IT Manager, DIRM Technical Lead, or support staff on call identifies any potential changes to IT infrastructure (e.g., hardware, server side software, middleware, third-party software components, mainframe printers, connectivity, etc.) needed to complete the effort and notifies management of the DIRM IT Infrastructure Section and/or DIRM Technical Support and Services (TSS) Unit as appropriate.
  b. Maintenance: DIRM IT Manager or DIRM Technical Lead identifies any potential changes to IT infrastructure needed to complete the effort and notifies management of the DIRM IT Infrastructure Section and/or the DIRM TSS Unit as appropriate.
  c. Enhancements: DIRM IT Manager or DIRM Technical Lead identifies any potential changes to IT infrastructure needed to complete the effort and notifies management of DIRM IT Infrastructure Section and/or DIRM TSS Unit as appropriate.
  d. New Development: While documenting the proposal on the DHHS ITGC forms, the Business Requestor works with the IT Director/Manager (e.g., business and/or DIRM) that provides IT support to identify any potential changes to IT infrastructure needed to complete the effort. Management of DIRM IT Infrastructure Section and/or /DIRM TSS Unit is notified of any impact.

- *Create/Evaluate Ballpark Total Cost of Ownership (TCO)[1] Estimate* – Unless otherwise noted, DIRM IT Manager develops staffing and budget estimate, working with the Business Requester as well as the DIRM IT Infrastructure Section and/or the DIRM TSS Unit as appropriate regarding IT Infrastructure changes.

    a. Production incident (i.e., problem/interrupt) resolution: Not applicable unless IT infrastructure changes are required.

    b. Maintenance: Not applicable unless IT infrastructure changes are required.

    c. Enhancements: Proceed to *Determine if Effort Requires Contract Staff and/or New Funds* sub activity (i.e., next bullet).

    d. New Development: Budget development occurs as part of the **1. Receive Business Request/Help Desk Ticket** activity.

        – TCO < $100K: DIRM IT Manager opens a help desk ticket and validates the estimates provided on the DHHS ITGC forms. Proceed to *Determine if Effort Requires Contract Staff and/or New Funds* sub activity (i.e., next bullet).

        – TCO ≥ $100K: Proceed to **3.b. Obtain Approval – DHHS ITGC** activity.

- *Determine if Effort Requires Contract Staff and/or New Funds.*

    a. Production incident (i.e., problem/interrupt) resolution: Not applicable unless new funds are needed to address necessary IT infrastructure changes (e.g., changes to hardware, server side software, middleware, third-party software components, mainframe printers, connectivity, etc.). If new funds are needed, DIRM IT Manager forwards estimate to DIRM Budget Officer for review; proceed to activity **3.a. Obtain Approval – DIRM Budget**. Otherwise, proceed to **4. Determine Risk** activity.

    b. Maintenance: Not applicable unless new funds are needed to cover changes to the IT infrastructure. If new funds are needed, DIRM IT Manager forwards estimate to DIRM Budget Officer for review; proceed to **3.a. Obtain Approval – DIRM Budget** activity. Otherwise, proceed to **4. Determine Risk** activity.

    c. Enhancements: If either contract staff and/or new funds (i.e., federal, state, etc.) are needed, DIRM IT Manager forwards effort to DIRM Budget Officer for review; proceed to **3.a. Obtain Approval – DIRM Budget** activity; otherwise, proceed to **4. Determine Risk** activity.

    d. New Development:

        – TCO < $100K: If either contract staff and/or new funds (i.e., federal, state, etc.) are needed, DIRM IT Manager forwards effort to DIRM Budget Officer for review; proceed to **3.a. Obtain Approval – DIRM Budget** activity; otherwise, proceed to **4. Determine Risk** activity.

        – TCO ≥ $100K: Proceed to **3.b. Obtain Approval – DHHS ITGC**. activity

3. Obtain Approval

3.a. Obtain Approval – DIRM Budget

a. Production incident (i.e., problem/interrupt) resolution: Not applicable unless new funding is needed for IT infrastructure changes. DIRM Budget Officer works with the business Budget Officer to identify funding sources. If additional funding sources have been identified that

[1] Total Cost of Ownership (TCO) is comprised of one-time implementation costs plus costs for five years of operations and maintenance.

require a budget revision and the related budget revision has been approved, or if a portion of the work can be performed without additional funding, proceed to **5. Assign Effort** activity. If not approved and no resolution can be completed without the funding, the DIRM IT Manager or DIRM Technical Lead updates and resolves the help desk ticket, and notifies the Business Requester as appropriate.

b. Maintenance: Not applicable unless new funding is needed for IT infrastructure changes. DIRM Budget Officer works with the business Budget Officer to identify funding sources. If additional funding sources have been identified that require a budget revision and the related budget revision has been approved, or if a portion of the work can be performed without additional funding, proceed to **4. Determine Risk** activity. If not approved and no work can be completed without the funding, the DIRM IT Manager or DIRM Technical Lead updates and resolves the help desk ticket, and notifies the Business Requester as appropriate.

c. Enhancements: DIRM Budget Officer reviews any contract staffing needed and verifies new funds (i.e., federal, state, etc.). DIRM Budget Officer works with the business Budget Officer to identify funding sources. If additional funding sources have been identified that require a budget revision and the related budget revision has been approved, proceed to **4. Determine Risk** activity. If not approved, the DIRM IT Manager or DIRM Technical Lead updates and resolves the help desk ticket, and notifies the Business Requester as appropriate.

d. New Development:

- TCO < $100K: DIRM Budget Officer reviews any contract staffing needed and verifies new/additional funds (i.e., federal, state, etc.) needed. DIRM Budget Officer works with the business Budget Officer to identify funding sources. If additional funding sources have been identified that require a budget revision and the related budget revision has been approved, proceed to **4. Determine Risk** activity. If not approved, the DIRM IT Manager updates and resolves the help desk ticket, and notifies the Business Requester as appropriate.
- TCO ≥ $100K: DIRM Budget Officer review occurs as part of **3.b. Obtain Approval – DHHS ITGC** activity.

3.b. Obtain Approval – DHHS ITGC

a. Production incident (i.e., problem/interrupt) resolution: Not applicable.

b. Maintenance: Not applicable.

c. Enhancements: Not applicable.

d. New Development:

- TCO < $100K: Not applicable.
- TCO ≥ $100K: Request undergoes DHHS ITGC review process.

  If approved by the DHHS ITGC, DHHS CIO Office notifies DIRM IT Manager, who opens a help desk ticket. Proceed to **4. Determine Risk** activity. If not approved, the DHHS ITGC notifies the Business Requester.

4. **Determine Risk** – Performed by the DIRM IT Manager or DIRM Technical Lead only to classify the effort either major (i.e., high risk) or minor (i.e., low risk).

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.

- *Maintenance:* DIRM IT Manager or DIRM Technical Lead completes the DIRM SDLC Risk Evaluator (https://www.ncsurveymax.com/TakeSurvey.aspx?SurveyID=745I8p2, survey ID is 745I8p2) to assess whether the effort is high or low risk.
- *Enhancement:* DIRM IT Manager or DIRM Technical Lead completes the DIRM SDLC Risk Evaluator (https://www.ncsurveymax.com/TakeSurvey.aspx?SurveyID=745I8p2, survey ID is 745I8p2) to assess whether the effort is high or low risk.
- *New Development:* DIRM IT Manager or DIRM Technical Lead completes the DIRM SDLC Risk Evaluator (https://www.ncsurveymax.com/TakeSurvey.aspx?SurveyID=745I8p2, survey ID is 745I8p2) to assess whether the effort is high or low risk.

NOTE:

DIRM IT Managers can request access to the DIRM SDLC Risk Evaluator for themselves or their DIRM Technical Lead(s) by sending an email to DIRM.Web.Service.Request@dhhs.nc.gov.

If changes in effort scope, impact, risk, and/or estimates are identified that could affect effort classification and risk, the **original risk evaluator must conduct another risk evaluation and obtain additional approvals if required** for the revised effort classification (i.e., DHHS ITGC and SCIO approvals as required for new development).

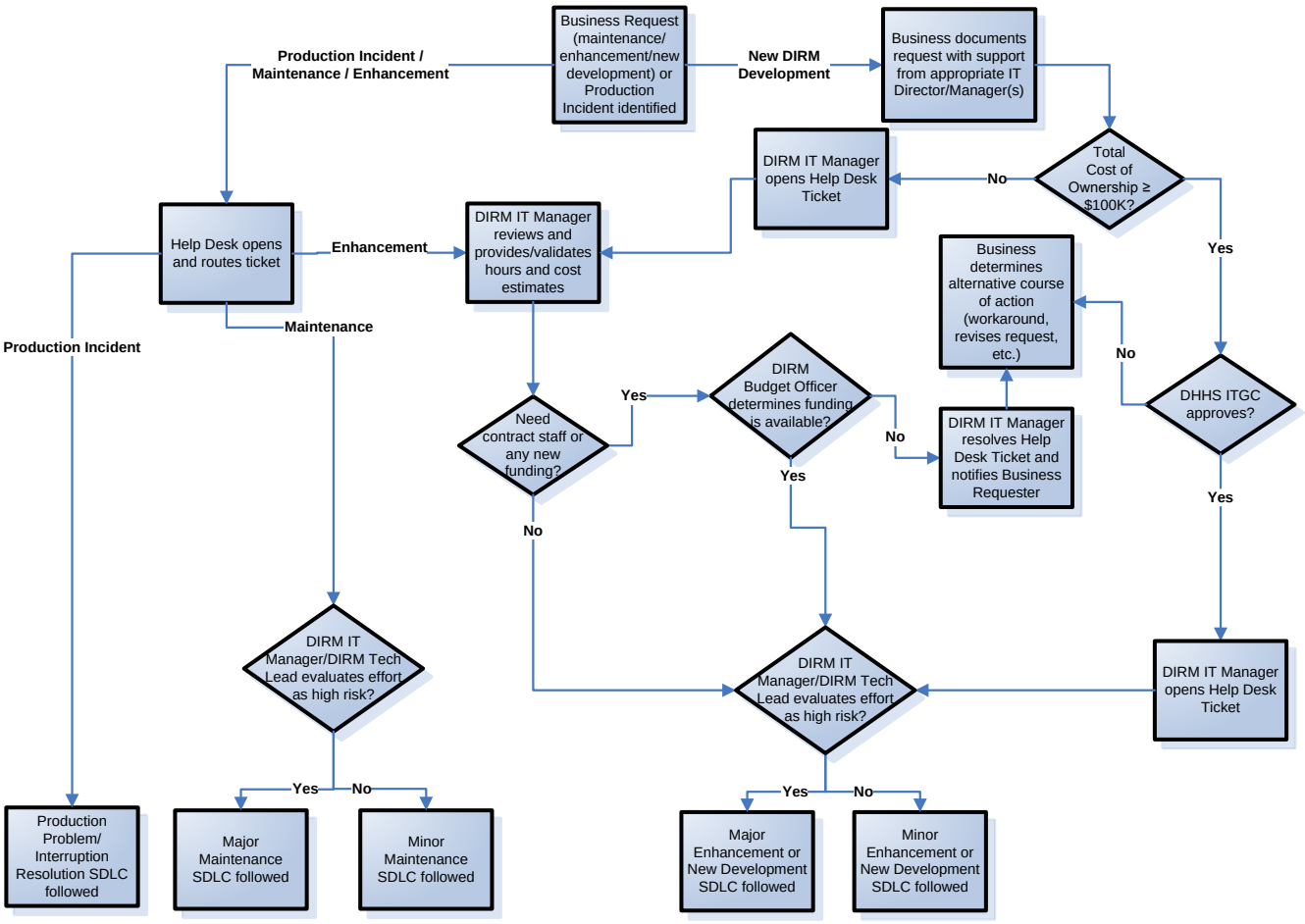
5. Assign Effort

- DIRM IT Manager or DIRM Technical Lead assigns the effort and the help desk ticket to the DIRM Applications Management Team and communicates the effort classification and risk determination to designate which DIRM SDLC path is required. This activity is required for all efforts.

  For links to the appropriate sections in this document, go to Applying the DIRM SDLC to an Effort.

A diagram of the Request Step workflow is provided in Figure 2.

Figure 2. DIRM SDLC Request Step Workflow



2.2.2 Plan Step

The major activities performed during the Plan Step are as follows. Responsibilities for deliverables are noted in the DIRM SDLC paths described in Sections 3-6. Unless otherwise noted, all documentation, approval signatures, and work products from the Plan Step must be saved in the archive designated for the solution/effort.

1. **Initiate Project Management Process**

   - *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
   - *Maintenance:* Not applicable.
   - *Enhancements:* For large-scale enhancements efforts identified by the DIRM IT Director for Applications Management and the DHHS Project Management Office (PMO) as needing to follow the SCIO PPM process, initiate the project management process and deliverables as required. See http://www.epmo.scio.nc.gov/default.aspx.
   - *New Development:* For new development efforts identified by the DIRM IT Director for Applications Management and the DHHS Project Management Office (PMO) as needing to follow the SCIO PPM process, initiate the project management process and deliverables as required. See http://www.epmo.scio.nc.gov/default.aspx.

2. Define Business Requirements

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* Business Owner documents the detailed business requirements. DIRM Applications Management Team may assist in identifying detailed business requirements. Business Owner approval of business requirements is required to proceed with the effort.
- *Enhancement:* Business Owner documents the detailed business requirements. DIRM Applications Management Team may assist in identifying detailed business requirements. Business Owner approval of business requirements is required to proceed with the effort.
- *New Development:* Business Owner documents the detailed business requirements. DIRM Applications Management Team may assist in identifying detailed business requirements. Business Owner approval of business requirements is required to proceed with the effort.

3. Define Technical Requirements

- *Production incident (i.e., problem/interrupt) resolution*: Not applicable.
- *Maintenance:* DIRM Applications Management Team documents the detailed technical requirements, which can be documented in the Simplified Statement of Work. The Requirements Traceability Matrix is updated if previously developed for the solution.
- *Enhancement:* DIRM Applications Management Team documents the detailed technical requirements, which for minor enhancements, can be documented in the Simplified Statement of Work (major enhancements must use the standalone template for technical requirements). The existing Requirements Traceability Matrix, if previously documented for the solution, is updated throughout effort to trace functional requirements through design, test, and implementation.
- *New Development:* DIRM Applications Management Team documents the detailed technical requirements. A Requirements Traceability Matrix is also created and updated throughout effort to trace functional requirements through design, test, and implementation.

4. Create Statement of Work (SOW)

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* DIRM IT Manager determines which sections of the Simplified SOW template must be completed (e.g., Technical Requirements section). DIRM IT Manager/DIRM Technical Lead documents scope, technical areas impacted by the effort, effort stakeholders, list of deliverables and acceptance criteria, resource and cost estimates, target implementation date, roles and responsibilities (includes reference to the DIRM Responsibility, Accountability, Consulted and Informed (RACI) matrix to indicate roles for deliverables and milestones for all Applications Management efforts), and assumptions and constraints. Outlines any procurement methods/steps planned for resources or assets for the effort. Also documents approval to proceed with the effort.
- *Enhancement:* The DIRM IT Manager determines which sections of the SOW template (minor enhancements use the Simplified SOW template; major enhancements use the full SOW template) must be completed (e.g., Technical Requirements section). DIRM IT Manager/DIRM Technical Lead documents scope, technical areas impacted by the effort, communications expectations and effort stakeholders, list of deliverables and acceptance criteria, resource and cost estimates, target implementation date, roles and responsibilities (includes reference to the DIRM RACI matrix for all Applications Management efforts), and assumptions and constraints. Outlines any procurement methods/steps planned for resources or assets for the effort. Also documents approval to proceed with the effort.
- *New Development:* The DIRM IT Manager determines which sections of the SOW template must be completed (e.g., Technical Requirements section). Project Manager or DIRM IT Manager/DIRM

Technical Lead documents scope, technical areas impacted by the effort, communications expectations and effort stakeholders, list of deliverables and acceptance criteria, resource and cost estimates, target implementation date, roles and responsibilities (includes reference to the DIRM RACI matrix for all Applications Management efforts), and assumptions and constraints. Outlines any procurement methods/steps planned for resources or assets for the effort. Also documents approval to proceed with the effort.

5. **Initiate Monitor and Control Process** –Monitor and control processes span the life cycle of the effort from the Request Step to the Implement Step, and includes activities such as timeline, deliverables, issues, risk, change, and vendor management, as well as performing status reporting and monitoring use of configuration management as appropriate for the effort type. For new development efforts involving a vendor(s), appropriate two-party or three-party Services Level Agreements (SLAs) are also drafted and executed in accordance with the effort's timeline/schedule. Executed SLAs are to be stored in the DIRM Vendor Management Section.

   All enhancement and new development efforts are required to develop and maintain a Detailed Schedule/Work Plan. See Appendix C for more information on the monitor and control activities.

   The DHHS Project Manager (PM), if assigned to an enhancement or new development effort, will perform all monitor and control processes as part of project management.

NOTE:

No template is provided for the Detailed Schedule/Work Plan as the details of this deliverable are unique to the scope and nature of the individual effort. The key components of the Detailed Schedule/Work Plan are provided in Appendix E.

When creating a Detailed Schedule/Work Plan for a major enhancement or new development effort, use of Microsoft Project is required.

6. **Design Solution**

   - *Production incident (i.e., problem/interrupt) resolution:* Requests to purchase and install new hardware/server side software or other IT infrastructure needs are coordinated during this activity if necessary.
   - *Maintenance:* The data dictionary and data mapping are updated as necessary, and programming specifications are also created to provide assigned programmers details of changes/coding to be performed as part of the effort. Requests to purchase and install new hardware/server side software or other IT infrastructure needs are coordinated during this activity if necessary.
   - *Enhancement:* The detailed design, data dictionary, and data mapping are updated as necessary, and programming specifications are also created to provide assigned programmers details of changes/coding to be performed as part of the effort. All design and programming specifications must adhere to the Statewide Information Security Manual.

     Large-scale enhancement efforts that report to the SCIO will also need to update or create the state Technical Architecture and System Design (TASD) document, which will require review by the DHHS Chief Technical Architect. For efforts not reporting to the SCIO, the DIRM IT Manager will determine if architectural changes resulting from enhancements require review by the DHHS Chief Technical Architect.

     Requests to purchase and install new hardware/server side software, or other infrastructure needs

such as integration with North Carolina Identity Management (NCID) are also coordinated during this activity as necessary.

- *New Development:* The detailed design, data dictionary, and data mapping are created as necessary, and programming specifications are also created to provide assigned programmers details of coding to be performed as part of the effort. All design and programming specifications must adhere to the Statewide Information Security Manual.

  New development efforts that report to the SCIO will also need to create the state TASD document, which will require review by the DHHS Chief Technical Architect.

  Requests to purchase and install new hardware/server side software, or other infrastructure needs such as integration with NCID are also coordinated during this activity as necessary.

7. Update/Create Plans

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* The Test Plan, a required overall strategic document for the solution, is updated or created as necessary to govern all types of testing possible for the solution.
- *Enhancement:* The DIRM Applications Management Team updates or creates both the Test Plan and Simplified Implementation Plan. The Test Plan is a required overall strategic document for the solution that describes all types of testing possible for the solution for all types of efforts. The Simplified Implementation Plan describes how the specific enhancement effort will be rolled out/implemented in production, and includes contingency or rollback plans. The DIRM Applications Management Team may also update or create a Data Conversion Plan as appropriate.

  The Business Information Security Official updates or creates the Security Plan (store in secure part of archive designated for the solution), with input from the DIRM Applications Management Team as appropriate. Business Owner updates or documents the Training Plan, unless otherwise specified in the Statement of Work and Detailed Schedule/Work Plan.
- *New Development:* The DIRM Applications Management Team creates both the Test Plan and Implementation Plan. The Test Plan is a required overall strategic document for the solution that describes all types of testing that will be conducted as part of the implementation effort, and will govern testing of any changes made to the solution thereafter. The Implementation Plan describes how the solution will be rolled out/implemented and includes contingency or rollback plans. The DIRM Applications Management Team also creates a Data Conversion Plan as appropriate.

  The Business Information Security Official creates the Security Plan (store in secure part of archive designated for the solution), with input from the DIRM Applications Management Team as appropriate. Business Owner also documents the Training Plan, unless otherwise specified in the Statement of Work and Detailed Schedule/Work Plan.

8. Update/Create Technical Test Cases and Automated Test Scripts

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* DIRM Applications Management Team documents or updates test cases and expected results for all technical testing categories (store in secure part of archive designated for the solution). DIRM Applications Management Team creates automated test scripts for test cases where applicable.

  The Business Owner is responsible for documenting UAT test cases and expected results.

- *Enhancement:* DIRM Applications Management Team documents and updates test cases and expected results for all technical testing categories (store in secure part of archive designated for the solution). DIRM Applications Management Team creates automated test scripts for test cases where applicable.

  The Business Owner is responsible for documenting UAT test cases and expected results.

- *New Development:* DIRM Applications Management Team documents test cases and expected results for all technical testing categories (store in secure part of archive designated for the solution). DIRM Applications Management Team creates automated test scripts for test cases where applicable.

  The Business Owner is responsible for documenting UAT test cases and expected results.

2.2.3 Build Step

The major activities performed during the Build Step are as follows. Responsibilities for deliverables deliverable are noted in the DIRM SDLC paths described in Sections 3-6. Unless otherwise noted, all documentation, approval signatures, and work products from the Plan Step must be saved in the archive designated for the solution/effort.

1. **Code/Build Solution**

   - *Production incident (i.e., problem/interrupt) resolution:* DIRM Applications Management Team resolves the production incident, using configuration management and coding as appropriate.

     DIRM Applications Management Team coordinates with IT infrastructure support (DIRM IT Infrastructure, DIRM TSS, and/or the Office of Information Technology Services (OITS)) to install hardware, server side software, and other IT infrastructure components needed to resolve the production incident.

   - *Maintenance:* DIRM Applications Management Team develops the change to the solution based on the approved design and using configuration management as appropriate.

     DIRM Applications Management Team coordinates with IT infrastructure support (DIRM IT Infrastructure, DIRM TSS, and/or OITS) to install hardware, server side software, and other IT infrastructure components needed to complete the maintenance request.

   - *Enhancement:* DIRM Applications Management Team develops the enhancement to the solution based on the approved design and using configuration management as appropriate.

     DIRM Applications Management Team coordinates with IT infrastructure support (DIRM IT Infrastructure, DIRM TSS, and/ or OITS) to install hardware, server side software, and other IT infrastructure components needed to complete the enhancement request. Integration with NCID also occurs if in scope for the enhancement effort.

   - *New Development:* DIRM Applications Management Team develops the solution based on the approved design and using configuration management as appropriate.

     DIRM Applications Management Team coordinates with IT infrastructure support (DIRM IT Infrastructure, DIRM TSS, and/ or OITS) to install hardware, server side software, and other IT infrastructure components needed to complete the new development request. Integration with NCID also occurs if in scope for the new development effort.

2. Conduct Unit Testing

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* DIRM Applications Management Team conducts unit testing on completed changes to the solution.
- *Enhancement:* DIRM Applications Management Team conducts unit testing on completed changes to the solution.
- *New Development:* DIRM Applications Management Team conducts unit testing on the coded solution module.

3. Perform Peer Review

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* If requested by the DIRM IT Manager, another programmer reviews the coded changes to the solution using a checklist.
- *Enhancement:* If requested by the DIRM IT Manager, another programmer reviews the coded changes to the solution using a checklist.
- *New Development:* If requested by the DIRM IT Manager, another programmer reviews the coded solution.

4. Execute Remaining Technical Testing

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* DIRM Applications Management Team performs all other technical testing that remains as defined in the SOW (e.g., system and regression, integration, data conversion, security, performance testing), and documents test findings and results (store in secure part of archive designated for the solution).
- *Enhancement:* DIRM Applications Management Team performs all other technical testing that remains as defined in the SOW (e.g., system and regression, integration, data conversion, security, performance testing), and documents test findings and results (store in secure part of archive designated for the solution).
- *New Development:* DIRM Applications Management Team performs all other technical testing that remains as defined in the Test Plan (e.g., system and regression, integration, data conversion, security, performance testing), and documents test findings and results (store in secure part of archive designated for the solution).

5. Execute User Acceptance Testing

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* Business Owner conducts UAT and reports problems (store in secure part of archive designated for the solution), retests as required to confirm fixes provided by DIRM, and provides UAT acceptance sign-off to DIRM. Business Owner sign-off on UAT is required to proceed with the effort along with the approval indicated in **9. Approval to Proceed to Implement Step**.
- *Enhancement:* Business Owner conducts UAT and reports problems (store in secure part of archive designated for the solution), retests as required to confirm fixes provided by DIRM, and provides UAT acceptance sign-off to DIRM. Business Owner sign-off on UAT is required to proceed with the effort along with the approval indicated in **9. Approval to Proceed to Implement Step**.
- *New Development:* Business Owner conducts UAT and reports problems (store in secure part of archive designated for the solution), retests as required to confirm fixes provided by DIRM, and

provides UAT acceptance sign-off to DIRM. Business Owner sign-off on UAT is required to proceed with the effort along with the approval indicated in **9. Approval to Proceed to Implement Step**.

6. Update/Create Disaster Recovery Procedures and Continuity Plans (BCP/COOP)

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* Not applicable.
- *Enhancement:* DIRM Applications Management Team updates or creates the Disaster Recovery Plan (store in secure part of archive designated for the solution) and provide updates as appropriate for the Business Owner's Business Continuity Plan (BCP). The DIRM IT Manager provides updates to the DIRM Continuity of Operations Plan (COOP) if applicable.
- *New Development:* DIRM Applications Management Team creates the Disaster Recovery Plan (store in secure part of archive designated for the solution) and provide updates as appropriate for the Business Owner's Business Continuity Plan (BCP). The DIRM IT Manager provides updates to the DIRM Continuity of Operations Plan (COOP) if applicable.

7. Update/Create User, Training, and System Documentation

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* Not applicable.
- *Enhancement:* The Business Owner updates or documents user guides and training materials unless otherwise specified in the SOW. DIRM Applications Management Team updates or documents system documentation as appropriate.
- *New Development:* The Business Owner documents user guides and training materials unless otherwise specified in the SOW. DIRM Applications Management Team documents system documentation as appropriate.

8. Update/Create Online Help Content

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* Not applicable.
- *Enhancement:* The Business Owner updates or documents online help content unless otherwise specified in the SOW.
- *New Development:* The Business Owner documents online help content unless otherwise specified in the SOW.

9. Approval to Proceed to Implement Step

- *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
- *Maintenance:* DIRM IT Manager or DIRM IT Director obtains approval from the Business Owner to move forward with implementation of the change to the solution on a specified date.
- *Enhancement:* DIRM IT Manager or DIRM IT Director obtains approval from the Business Owner to move forward with implementation of the enhancement on a specified date.
- *New Development:* DIRM IT Manager or DIRM IT Director obtains approval from the Business Owner to move forward with implementation of the new solution on a specified date.

2.2.4 Implement Step

The major activities performed during the Implement Step are as follows. Responsibilities for deliverables deliverable are noted in the DIRM SDLC paths described in Sections 3-6. Unless otherwise noted, all documentation, approval signatures, and work products from the Plan Step must be saved in the archive designated for the solution/effort.

1. **Conduct Training**
   - *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
   - *Maintenance:* Not applicable.
   - *Enhancement:* Business Owner conducts end user training unless otherwise specified in the SOW and Detailed Schedule/Work Plan. DIRM Applications Management Team conducts technical training as appropriate.
   - *New Development:* Business Owner conducts end user training unless otherwise specified in the SOW and Detailed Schedule/Work Plan. DIRM Applications Management Team conducts technical training as appropriate.
2. **Update/Create Implementation Checklist**
   - *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
   - *Maintenance:* DIRM Applications Management Team updates or creates the checklist to be used during installation or rollout of the changed solution to ensure that all technical and functional required steps for migration to production are addressed.
   - *Enhancement:* DIRM Applications Management Team updates or creates the checklist to be used during installation or rollout of the enhanced solution to ensure that all technical and functional required steps for migration to production are addressed.
   - *New Development:* DIRM Applications Management Team creates the checklist to be used during installation or rollout of the new solution to ensure that all technical and functional required steps for migration to production are addressed.
3. **Install/Roll Out Solution** –Using the appropriate DIRM approved Configuration Management Process for the technology, designated DIRM Applications Management staff migrates the solution release/incident fix to the production environment. This activity is required for all efforts.
4. **Conduct Technical and Business Post-Implementation Verification** – DIRM Applications Management Team conducts technical review of implemented system to ensure production migration steps were successful. Business Owner conducts post implementation review of production output within two business days. This activity is required for all efforts.
5. **Update Application Portfolio Management (APM)**
   - *Production incident (i.e., problem/interrupt) resolution:* Not applicable.
   - *Maintenance:* DIRM IT Manager gathers data needed to update the entry in the state's APM regarding the solution as appropriate.
   - *Enhancement:* DIRM IT Manager gathers data needed to update the entry in the state's APM regarding the solution as appropriate.
   - *New Development:* DIRM IT Manager gathers data needed to create an entry in the state's APM regarding the solution as appropriate.

6. **Close Out Effort** – DIRM Applications Management Team performs the following effort close out tasks as appropriate.
    - *Document Lessons Learned* – For new development only, DIRM Applications Management Team, Business Owner and other participants in the effort review the effort and document any lessons learned for process improvement, as appropriate.
    - *Final Validation of Documentation Stored in Designated Archive* – For all efforts, DIRM IT Manager is required to validate that staff have resolved the ticket and archived all documentation, formal deliverables, handwritten notes, test results, etc. related to the effort in the archive designated for the solution/effort.

2.3 Storing Documentation for DIRM SDLC Efforts

Each solution is to have an archive established in the **\\Dirm\SHARE\SDLC Archive** directory on the DIRM shared drive. DIRM staff are to save all documentation (i.e., most recent working draft and all final versions of deliverables, test results providing proof of successful testing, and signed deliverable approval forms) associated with each effort in the solution folder, or appropriate subfolder. Physical signatures are required on all approval documents and other pages/forms that require signature.

NOTE:

DIRM Applications Management staff must retain all documentation related to efforts. No documentation is to be deleted unless DIRM management issues a directive to purge.

2.3.1 Requesting an Archive Folder for a Solution

If a new folder is needed in the **SDLC Archive** directory for your solution, DIRM IT Managers can open a network access request ticket with the DHHS CSC to create a new folder in the SDLC Archive directory. Include the following information in the request:

1. The name of the new folder, which should be the acronym for the solution (e.g., **ACTS, ARMS, HEARTS, SCCRS**).
2. The list of DIRM staff (i.e., the DIRM IT Manager, and all direct reports, including state employees, temporary staff, and contractors) that are to have **full** access to this folder.
3. Request that a protected **SECURE** folder be created within the solution folder (e.g., **\\SDLC Archive\ACTS\SECURE**). The DIRM staff with full access to the solution folder are to have full access to the SECURE folder, but the folder is to be hidden from view for all other DIRM staff unless full rights are granted to the entire SDLC Archive folder.

NOTE:

All DIRM staff have read-only access to the SDLC Archive directory, so you must specify which staff can write to the solution's folder and have the ability to view and write to the SECURE folder within the solution folder.

2.3.2 Directory Structure within the SDLC Archive

At his/her discretion, the DIRM IT Manager, can create a subfolder within the solution folder for each functional area of the solution (e.g., subsystem). The instructions provided in this section will assume that the DIRM IT Manager has not created any functional area subfolders. If subfolders have been created, apply whatever is instructed within this section for the "solution folder" or "solution" to the "functional area subfolder" or "functional area."

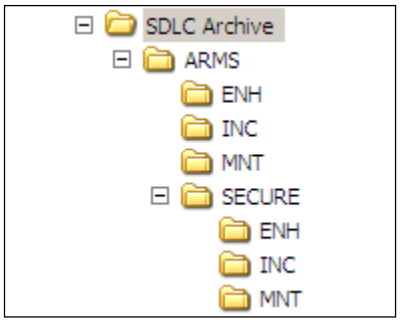
2.3.2.1 Legacy Solutions Already in Production

Under the solution folder for solutions that are already in production, create one folder (three total) for each type of legacy solution support effort:

1. **INC** (incidents)
2. **MNT** (maintenance)
3. **ENH** (enhancement)

Add the same three folders to the **SECURE** folder for the solution.

EXAMPLE: for the legacy Aging Resource Management System (ARMS), the directory structure will be:



Whenever you receive a request for the solution, open a new folder within the appropriate effort type folder and in the same effort type folder in the SECURE folder using the following naming convention:

YYYYMMDD RTICKET# ShortName

For **RTICKET#**, **R** = Remedy. This letter would change if the state were to replace its Remedy incident tracking system with another system. For the **TICKET#**, drop any leading zeros. **ShortName** is a short descriptive name for the effort, preferably no more than 15 characters.

Help desk tickets would be submitted by either a business requester or the DIRM IT Manager/DIRM Technical Lead depending on who receives the business request first. Ensure that help desk tickets are created as soon as requests are received to ensure that all documentation related to the effort can be saved with the help desk ticket number.

EXAMPLE: for a maintenance request (Remedy ticket number 2615266) received on 5/30/2014, the purpose of which is to change the Child Name data field label in SCCRS, the following folders would be created:

\\SDLC Archive\SCCRS\MNT\20140530 R2615266 ChildNameLabel

\\SDLC Archive\SCCRS\SECURE\MNT\20140530 R2615266 ChildNameLabel

Once the folders for tracking the efforts have been created (i.e., one in the main effort type folder, the other in the effort type folder in the **SECURE** folder), paste a copy of the directory structure from **\\Dirm\SHARE\PPSGF.ETC\00 SDLC\Templates** or **\\Dirm\SHARE\PPSGF.ETC\00 SDLC\Templates\SECURE** as appropriate. However, if the effort is a production incident, only copy the directory structure if needed to store documentation created in addition to the help desk ticket. If this is the case, for production incidents, only the high-level incident folder with the help desk ticket number and short name will be created.

NOTE:

For efforts that were in process prior to May 15, 2014, create a .TXT file at the root of the two folders for the specific effort (i.e., including the one in the **SECURE** folder) called **PLEASE READ.TXT**. This file is to contain a statement indicating when the effort started and the date on which use of the new format was initiated.

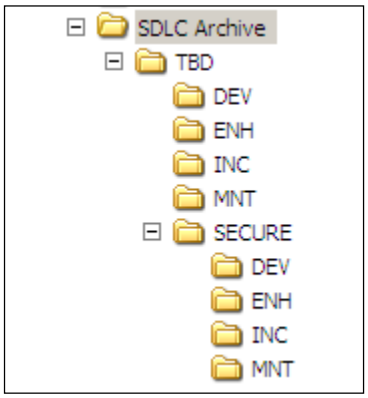
2.3.2.2 New Solutions under Development

For a new development effort (i.e., for a solution that is not already in production), under the solution/functional area folder, create four folders, one for each type of legacy support effort and an additional folder for the new development effort:

1. **INC** (incidents)
2. **MNT** (maintenance)
3. **ENH** (enhancement)
4. **DEV** (new development)

Add the same four folders to the **SECURE** folder.

Example, if a new solution with an acronym TBD is under development, then the following directory structure is to be created:

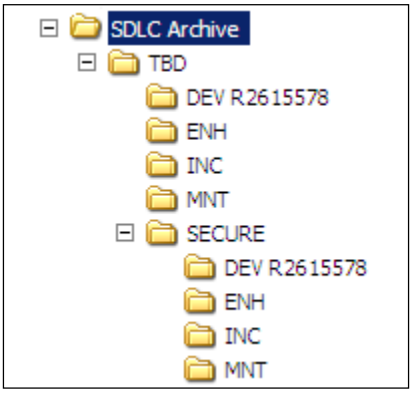


NOTE:

The **INC**, **MNT** and **ENH** folders would be used for related requests after the solution has been put into production. See Section 2.3.2.1 Legacy Solutions Already in Production for information on how to create specific folders for requested incident, maintenance, and enhancement efforts.

Once a help desk ticket has been created for the new development effort, add **RTICKET#** to the **DEV** folder name.

EXAMPLE: If a Remedy ticket **2615578** has been opened for the new development effort, rename the DEV folders (i.e., at both the solution level and within the **SECURE** folder) to **DEV R2615578**.



Within the DEV effort folders, including the one in the SECURE folder, paste a copy of the directory structure from **Dirm\SHARE\PPSGF.ETC**\00 SDLC\Templates or **Dirm\SHARE\PPSGF.ETC**\00 SDLC\Templates\SECURE, respectively.

For efforts that were in process prior to May 15, 2014, create a .TXT file at the root of the DEV effort folders called **PLEASE READ.TXT**. This file is to contain a statement indicating when the effort started and the date on which use of the new format was initiated.

2.3.3 File Names and Version Control

For all effort types, modify templates to contain information for the effort, and add the **RTICKET#** to the file name, along with a version control number.

To version control deliverable documents, list drafts before the first final version as v0.1, v0.2, and so on, and label the first final version as v1.0. If changes are made to the deliverable after the first final version has been crated, number the drafts v1.1, v1.2, and so on, until the next final version (v2.0) is released.

EXAMPLE: To save the first draft of the Statement of Work document in this directory for the SCCRS example provided in Section 2.3.2.1 Legacy Solutions Already in Production, the directory path and file name would be:

\\SDLC Archive\SCCRS\MNT\20140504 R2615266 ChildNameLabel\03 SOW\SOW R2615266 v0.1.DOC

NOTE:

To ensure files are accessible, please use the shortest file name possible. DIRM IT Infrastructure has advised that full file names (i.e., full directory path plus file name) contain no more than 240 characters (220 characters are recommended).

Templates that are not used (i.e., are not required for the effort due to effort type and scope of the particular effort) can be deleted from the deliverable folder and **NA** added to the folder name.

> EXAMPLE: If an enhancement effort does not include data conversion, change the name of the **09_Data_Convrsn_Pln** folder to **09_Data_Convrsn_Pln NA**.

When developing a new solution, store all deliverables within the appropriate folders in the **DEV** folders. If a subsequent support effort (i.e., after the new solution has been implemented) does not require modification to a strategic solution-level document such as the Test Plan, create either a **PLEASE READ.txt** file containing the directory path or a shortcut in the deliverable folder for the effort to indicate the location of that deliverable (i.e., in the **DEV** folder directory).

For legacy applications, strategic documents that need to be created or modified during a specific legacy support effort, save the created/modified document at the root of the solution folder, and create either a **PLEASE READ.txt** file containing the directory path or a shortcut in the deliverable folder for the effort to indicate the location of that deliverable.

Documents that must be stored in the SECURE effort folder are the:

1. Security Plan (a deliverable owned by the Business Information Security Officer)
2. Disaster Recovery Plan
3. Technical Test Cases and Findings/Results and documentation providing proof of successful testing
4. UAT Problem Report Log (a deliverable owned by the Business Owner)
5. Any other document with detailed security information or sensitive data about clients served by DHHS and/or our business partners.

Final versions of documents are to be saved both in the native format (e.g., Microsoft Word or Excel), and saved as a PDF for delivery for approval. Approval of DIRM deliverables is to be documented on the Deliverable Signoff form that is available at the root of **\\Dirm\SHARE\PPSGF.ETC**\00 SDLC\Templates.

2.4 Applying the DIRM SDLC to an Effort

The details of the DIRM SDLC requirements for each effort type and risk level are provided in the following sections:

- Production Incident Resolution
- Maintenance
- Enhancement
- New Development

2.5 DIRM SDLC Release Schedule

The DIRM SDLC will be revised and released on an annual basis. All DIRM Applications Management staff are required to follow the current approved DIRM SDLC at all times.

DIRM staff are to forward any identified issues or proposed changes regarding the DIRM SDLC workflow process or template(s) to their DIRM IT Manager, who will in turn forward the item(s) to the DIRM IT Directors of Applications Management for review and consideration. If approved, the DIRM IT Directors will authorize updates to this document as part of the annual release process or as an emergency revision. Feedback regarding the DIRM SDLC can be documented on the SDLC Feedback Form provided in the **\\00 SDLC\SDLC_Doc** directory on the DIRM Policy drive.

Revisions to the DIRM SDLC will be listed in the Version History log provided on page 2 of this document. While any proposed change is under review, DIRM staff must continue to follow the current approved process and templates. Once finalized, any revisions to the DIRM SDLC and/or deliverable templates will be communicated to DIRM staff.

3. PRODUCTION INCIDENT RESOLUTION

3.1 Purpose

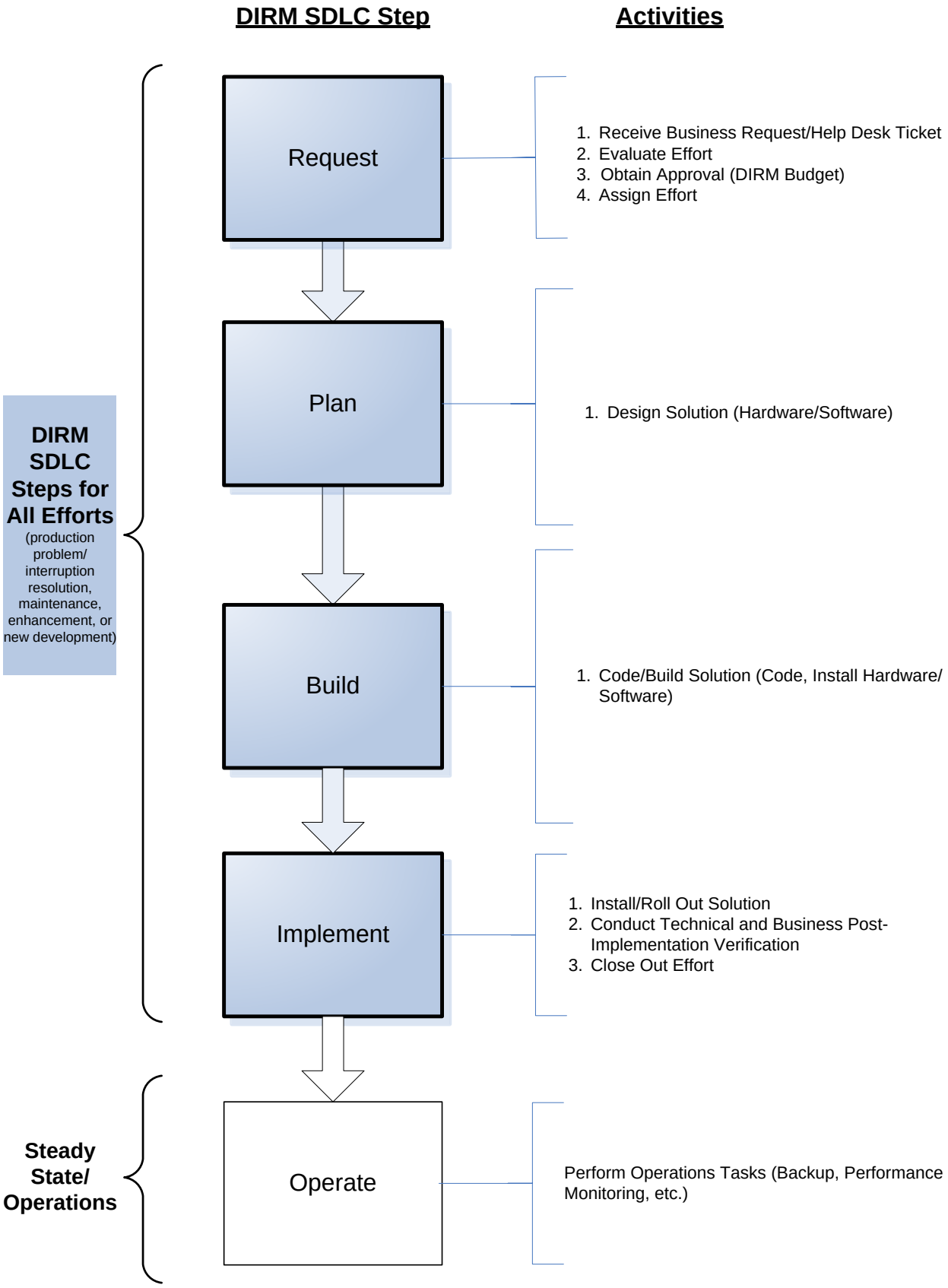
This section describes the DIRM SDLC process for a production incident (i.e., problem/interrupt) resolution effort.

Production incident resolution is an effort to correct immediately a problem or interruption for an application and/or system/solution component. Examples of production incident (i.e., problem/interrupt) resolution efforts are provided in Appendix B.

3.2 Workflow

Figure 3 depicts the overall workflow of the DIRM SDLC Steps required for a production incident resolution effort. This workflow applies to all production incident resolution efforts. Unless otherwise specified, all deliverables and work products from one DIRM SDLC Step must be complete and accepted prior to commencing work in the next DIRM SDLC Step; however, depending upon the scope of the effort and level of risk, some activities within a step may vary, and the activities can be completed in parallel.

Figure 3. DIRM SDLC Workflow for Production Incident Resolution



The details for each DIRM SDLC Step are provided in DIRM SDLC Steps. The details provided include:

- Activities
- Activity owners
- Associated deliverables and work products
- Deliverable/work product approvals

A consolidated deliverable/work product list for all effort categories is documented in Appendix E. The consolidated list provides a description of the document content and the required deliverables for each effort category.

3.3 DIRM SDLC Steps

3.3.1 Request Step

The purpose of the Request Step is to receive; approve; and evaluate effort for effort type classification; and assign an effort to a DIRM Applications Management Team.

The activities of the Request Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Receive Business Request/Help Desk Ticket**			
	• Report incident (i.e., problem/ interrupt) to the appropriate help desk (e.g., DHHS CSC) with supporting documentation as appropriate.	Business Requester/ Technical Requester	Supporting documentation (S)	• N/A
	• Assign the help desk ticket to the DIRM IT Manager, DIRM Technical Lead, or staff on call for the solution. If problem is reported after hours, DIRM staff on call opens the help ticket or forwards the information to staff who can create the ticket during normal business hours.	Help Desk	Help Desk Ticket (R)	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
2.	**Evaluate Effort, Staffing, and Cost Required**			

	• Confirm that the request/help desk ticket is a production incident (i.e., problem/interrupt) resolution effort.
	  • Yes, continue to use Production Problem/Interrupt/Incident Resolution SDLC.
	  • No, route the request/help desk ticket as appropriate for Maintenance, Enhancement, or New Development effort.
		DIRM IT Manager/DIRM Technical Lead/DIRM staff on call	N/A	• N/A

	• Identify IT infrastructure impacts (e.g., hardware, server side software, middleware, third-party software components, mainframe printers, connectivity, etc.) and notify management of the DIRM IT Infrastructure Section and/or DIRM Technical Support and Services (TSS) Unit as appropriate.	DIRM IT Manager/DIRM Technical Lead/DIRM staff on call	N/A	• N/A
	• Work with DIRM IT Infrastructure Section and/or DIRM TSS Unit to develop estimate for IT infrastructure changes needed.	DIRM IT Manager	N/A	• N/A
3.	**Obtain Approval – DIRM Budget**			

	• If IT infrastructure changes require funding, work with business Budget Officer to identify funding sources and determine if additional funding sources have been identified that require a budget revision.
	  • Yes – Notify the DIRM IT Manager when the budget revision is approved.
	  • No (or budget revision not approved) – Proceed with part of the effort that does not require the funding needed, or if none, DIRM IT Manager/DIRM Technical Lead updates and resolves help desk ticket.
		DIRM Budget Officer	N/A	• N/A

4.	**Assign Effort**			
	• Assign the effort to the appropriate DIRM Applications Management Team to commence the Plan Step.	DIRM IT Manager/DIRM Technical Lead/DIRM staff on call	N/A	• N/A

3.3.2 Plan Step

The purpose of the Plan Step is to initiate design activities as required to resolve the incident.

All deliverables and work products from the previous step must be complete and accepted prior to commencing work in the Plan Step.

The activities of the Plan Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). Unless otherwise specified, all other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Design Solution**			
	• In accordance with DIRM IT Infrastructure, DIRM TSS, and/or OITS procedures, coordinate to request and purchase new hardware, and/or server side software as appropriate.	DIRM Apps Mgmt Team	Linux Service Account Linux User ID; Server Farm Request OITS Hosting Services – New Project/Server Client Questionnaire, Solaris/AIX OITS Hosting Services – New Project/Server Client Questionnaire OITS Server Farm Request OITS Server Farm Request Form Other OITS forms as appropriate (S)	• As specified on form

3.3.3 Build Step

The purpose of the Build Step is to code/build and test the solution.

The activities of the Build Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

NOTE:

DIRM Applications Management Team staff and designated approvers must use the configuration management process and tool to check out, check in, and move code to the appropriate library throughout the Build Step process. For more detail, refer to the Configuration Management Process in Appendix D.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Code/Build Solution**			
	• Coordinate with DIRM IT Infrastructure, DIRM TSS, and/or OITS to install and validate new hardware and/or server side software as appropriate.	DIRM Apps Mgmt Team	Installed hardware/server side software (S)	• DIRM IT Manager
	• Using the appropriate DIRM approved Configuration Management Process for the technology, check out the code.	DIRM Apps Mgmt Team	N/A	• N/A
	• Develop/code the solution.	DIRM Apps Mgmt Team	Solution Code (S)	• N/A
	• Use the appropriate configuration management process/tool for the platform to check in the code (see Appendix D).	DIRM Apps Mgmt Team	N/A	• N/A
	• Use the appropriate configuration management tool/process to move the code to the UAT library and promote the code to the UAT environment (see Appendix D).	DIRM Apps Mgmt Team	Configuration Management tool history of approval and promotion of code/build/release (S)	• As designated for the configuration management process

3.3.4 Implement Step

The purpose of the Implement Step is to install the incident resolution and close out effort. Close out efforts include archiving effort documentation.

All deliverables and work products from the previous step must be complete and accepted prior to commencing work in the Implement Step.

The activities of the Implement Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

NOTE:

DIRM Applications Management Team staff and designated approvers must use the configuration management process and tool to check out, check in, and move code to the appropriate library throughout the Build Step process. For more detail, refer to the Configuration Management Process in Appendix D.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Install/Rollout Solution**			
	• Use the appropriate configuration management tool/process to move the code to the production library and promote the code/build release to the production environment.	Designated DIRM Apps Mgmt staff	Configuration Management tool history of approval and promotion of code/build/release (S)	• As designated for the configuration management process
2.	**Conduct Technical and Business Post Implementation Verification**			
	• Conduct technical post implementation review of the solution to verify that all the appropriate production migration steps were successful.	DIRM Apps Mgmt Team	N/A	• DIRM Technical Lead
	• Conduct business post implementation review of production output (e.g., screens, reports, printed output, etc.; sample determined by business) within two business days of implementation or production execution, whichever is later.	Business Owner	N/A	• Business Owner to send notification to DIRM IT Manager/ DIRM Technical Lead
3.	**Close out Effort**			
	• Validate that the ticket is resolved and all documentation, formal deliverables, handwritten notes, test results, etc. related to the effort in the archive designated for the solution/effort.	DIRM IT Manager or DIRM Technical Lead	N/A	• N/A

After the effort is closed out, the solution proceeds to the Operate Step for ongoing operations.

4. MAINTENANCE

4.1 Purpose

This section describes the DIRM SDLC process for the following classifications of IT efforts:

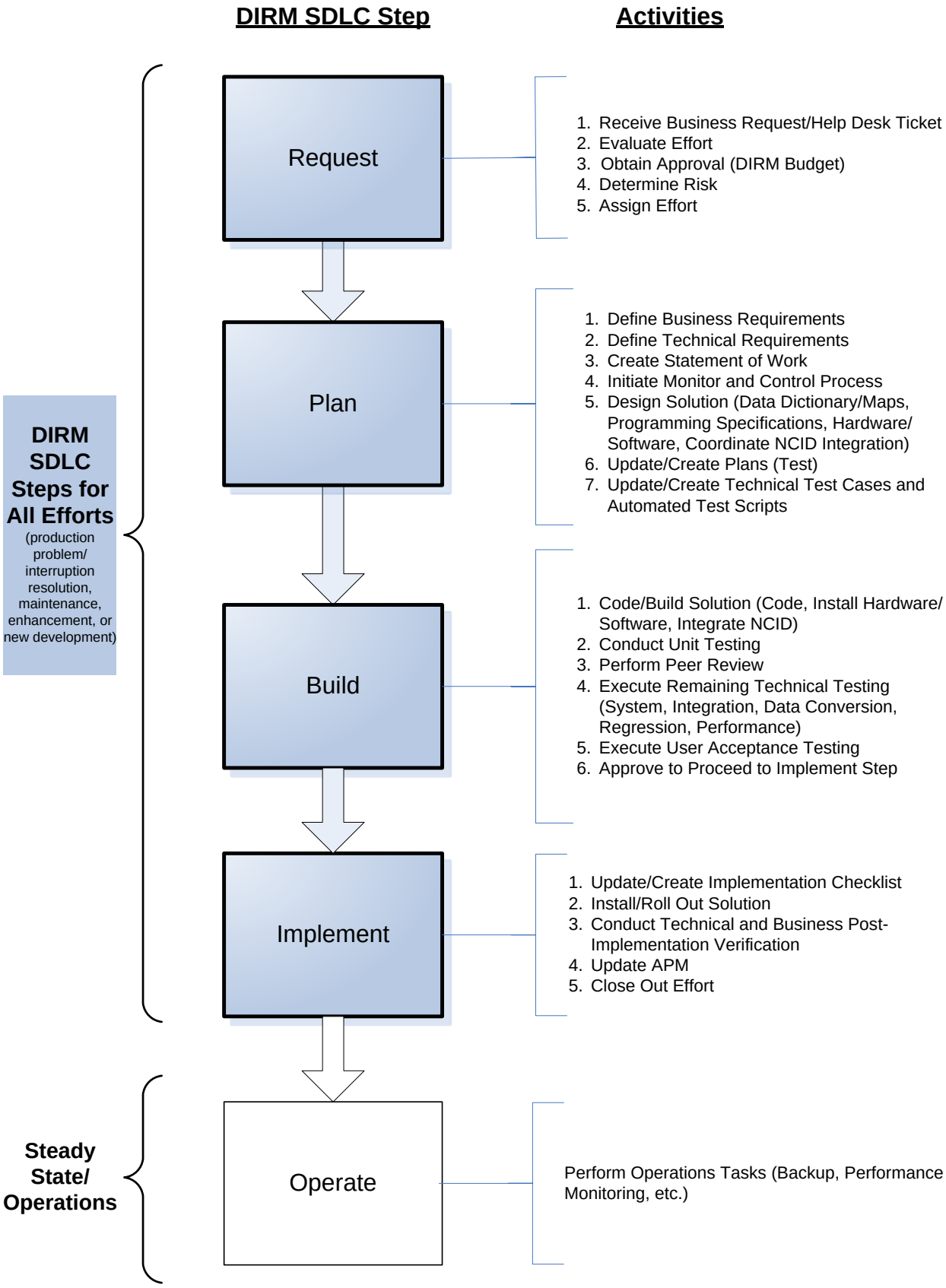
- A major maintenance effort
- A minor maintenance effort

Maintenance is the process of supporting a production application and/or system/solution component after delivery to correct defects, maintain performance, and/or maintain compatibility with other elements in the technical environment to ensure that the existing system/solution and/or business functionality ultimately continues to operate as already designed. The maintenance of the application and/or component is not constrained by the time and/or size of the effort. Examples of maintenance are provided in Appendix B.

4.2 Workflow

Figure 4 depicts the overall workflow of the DIRM SDLC Steps required for a maintenance effort. This workflow applies to all maintenance efforts. Unless otherwise specified, all deliverables and work products from one DIRM SDLC Step must be complete and accepted prior to commencing work in the next DIRM SDLC Step; however, depending upon the scope of the effort and level of risk, some activities within a step may vary, and the activities can be completed in parallel.

Figure 4. DIRM SDLC Workflow for Maintenance



The details for each DIRM SDLC Step are provided in DIRM SDLC Steps. The details provided include:

- Activities
- Activity owners
- Associated deliverables and work products
- Deliverable/work product approvals

A consolidated deliverable/work product list for all effort categories is documented in Appendix E. The consolidated list provides a description of the document content and the required deliverables for each effort category.

4.3 DIRM SDLC Steps

4.3.1 Request Step

The purpose of the Request Step is to receive; approve; and evaluate effort for effort type classification, size (hours/cost), and risk level; and assign an effort to a DIRM Applications Management Team.

The activities of the Request Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Receive Business Request/Help Desk Ticket**			
	• Submit request to the appropriate help desk (e.g., DHHS CSC) with supporting documentation as appropriate. • If Business Owners request maintenance through another process, the DIRM IT Manager or DIRM Technical Lead for the solution must open a ticket with the appropriate help desk.	Business Requester/ Technical Requester	N/A	• N/A
	• Assign the help desk ticket to the DIRM IT Manager or DIRM Technical Lead for the solution.	Help Desk	Help Desk Ticket (R)	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
2.	**Evaluate Effort, Staffing, and Cost Required**			

	• Confirm that the request is a maintenance effort.
	  • Yes, continue to use Maintenance SDLC.
	  • No, route the request/help desk ticket as appropriate for Production Incident Resolution, Enhancement, or New Development effort.
		DIRM IT Manager/DIRM Technical Lead	N/A	• N/A

	• Identify estimated IT infrastructure impacts (e.g., hardware, server side software, middleware, third-party software components, mainframe printers, connectivity, etc.) and notify management of the DIRM IT Infrastructure Section and/or DIRM Technical Support and Services (TSS) Unit as appropriate.	DIRM IT Manager/DIRM Technical Lead	N/A	• N/A
	• Work with DIRM IT Infrastructure and/or DIRM TSS Unit to develop estimate for IT infrastructure changes needed.	DIRM IT Manager	N/A	• N/A
3.	**Obtain Approval – DIRM Budget**			

	• If IT infrastructure changes require funding, work with business Budget Officer to identify funding sources and determine if additional funding sources have been identified that require a budget revision.
	  • Yes – Notify the DIRM IT Manager when the budget revision is approved.
	  • No (or budget revision not approved) – Proceed with part of the effort that does not require the funding needed, or if none, DIRM IT Manager/DIRM Technical Lead updates and resolves the help desk ticket, and notifies the Business Requester as appropriate.
		DIRM Budget Officer	N/A	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
4.	**Determine Risk**			
	• Complete the DIRM SDLC Risk Evaluator located at (https://www.ncsurveymax.com/TakeSurvey.aspx?SurveyID=745I8p2)(survey ID is 745I8p2) and save a copy of the received from the DIRM SDLC Risk Evaluator to the archive designated for the solution/effort.Save additional results as well if the effort is re-evaluated at a later date.	DIRM IT Manager/DIRM Technical Lead	DIRM SDLC Risk Evaluation Tool Results (R)	• N/A
5.	**Assign Effort**			
	• Assign the effort to the appropriate DIRM Applications Management Team to commence the Plan Step.	DIRM IT Manager/DIRM Technical Lead	N/A	• N/A

4.3.2 Plan Step

The purpose of the Plan Step is to initiate monitor and control activities; gather and analyze requirements; define the Statement of Work and project schedule; design the solution; and develop plans needed to implement the solution.

All deliverables and work products from the previous step must be complete and accepted prior to commencing work in the Plan Step.

The activities of the Plan Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Define Business Requirements**			
	• Document the detailed business requirements for the maintenance request. DIRM Applications Management Team may assist in identifying detailed business requirements.	Business Owner	Detailed Business Requirements Document (R)	• Business Owner (required to proceed with the effort)

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
2.	**Define Technical Requirements**			

	• Document the detailed technical requirements for the request as appropriate. Examples include:
	  • Operational requirements
	  • Data requirements
	  • Security
	  • System Interfaces
	  • Disaster recovery
	  • Hardware
	  • Software
	  Does not include items that will be documented in the programming specifications.
	* DIRM IT Manager may determine that technical requirements can be documented in the SOW.
		DIRM Apps Mgmt Team	Detailed Technical Requirements Document (or can be documented in SOW) (S)	• DIRM IT Manager

	• Update the existing (i.e., previously documented) Requirements Traceability Matrix as appropriate throughout the effort to trace functional requirements through to design, test, and implementation.	DIRM Apps Mgmt Team	Requirements Traceability Matrix (S)	• DIRM Technical Lead
3.	**Create Statement of Work**			
	• Create a Statement of Work (SOW). The DIRM IT Manager determines which sections of the SOW template must be completed.	DIRM IT Manager/DIRM Technical Lead	Simplified Statement of Work (R)	• DIRM IT Manager • Business Owner (final formal approval)
4.	**Initiate Monitor and Control Process (See Appendix C)**			
	• Initiate status reporting to the business, to include at a minimum: tasks completed in cycle, tasks planned next cycle, and issues/risks. Biweekly reporting is recommended unless another schedule is negotiated with the business.	DIRM IT Manager/DIRM Technical Lead	Effort Status Report (R)	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Document, track and escalate or mitigate issues and risks when identified for the effort throughout the effort life cycle. Also track changes made to the effort via approved change requests (see below). This log is used only when issues, risks or changes are identified for the effort.	DIRM IT Manager/DIRM Technical Lead	Monitoring and Control Log (S)	• N/A
	• Document change requests (CR) identified throughout the effort life cycle as needed. Change requests can be identified by the DIRM Applications Management Team or the Business Owner. The DIRM IT Manager or DIRM Technical Lead must perform an impact analysis that includes updating deliverables appropriately and repeating the DIRM SDLC Risk Evaluator if the CR includes a change in scope.	Business Owner and/or DIRM IT Manager/DIRM Technical Lead	Change Request documented in Help Desk Ticket (S)	• DIRM IT Manager • Business Owner
	• Monitor the delivery, approval of and updates to deliverables throughout the effort lifecycle.	DIRM IT Manager/DIRM Technical Lead	Deliverable Approval forms (R)	• Designated approvers per the SDLC.
	• Manage vendors and amend contracts as appropriate throughout the effort lifecycle.	DHHS Contract Administrator	Amended DIRM Contract (S)	• Vendor Contract Administrator • DHHS Contract Administrator
	• Monitor the use of the DIRM approved configuration management process/tool appropriate for the platform throughout the effort lifecycle (see Appendix D).	DIRM IT Manager	Configuration Management tool history (R)	• As designated for the configuration management process
5.	**Design Solution**			
	• Assess and update the data dictionary (can be auto generated) and data mapping documentation as appropriate. * Update if the Data Dictionary and/or Data Mapping documents have already been created for the production solution.	DIRM Apps Mgmt Team	Data Dictionary (S*) Data Mapping (S*)	• DIRM IT Manager/ DIRM Technical Lead (i.e., next level manager)

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Create programming specifications needed to code the change to the solution, assuring compliance with the Statewide Information Security Manual. * Required if changes are to be made to the code.	DIRM Apps Mgmt Team	Programming Specifications (S*)	• DIRM IT Manager/ DIRM Technical Lead (i.e., next level manager)
	• In accordance with DIRM IT Infrastructure, DIRM TSS, and/or OITS procedures, coordinate to request and purchase new hardware, and/or server side software as appropriate.	DIRM Apps Mgmt Team	Linux Service Account Linux User ID; Server Farm Request OITS Hosting Services – New Project/Server Client Questionnaire, Solaris/AIX OITS Hosting Services – New Project/Server Client Questionnaire OITS Server Farm Request OITS Server Farm Request Form Other OITS forms as appropriate (S)	• As specified on form

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
6.	**Update/Create Plans**			

	• Assess and update or create the Test Plan as appropriate. The test categories are (R = required; S = scope dependent):
	  • Technical Testing
	  – Unit Testing (R)
	  – System and Regression Testing (R)
	  – Interface Testing (S)
	  – Data Conversion Testing (S)
	  – Security Testing (S)
	  – Performance Testing (i.e., including load and stress) (S)
	  • Functional Testing
	  – User Acceptance Testing (UAT) (R) **NOTE:** This document will contain only the plan for UAT; all UAT Test Case development and UAT testing are the responsibility of the Business Owner.
	*The Test Plan is a strategic document that is required for the solution and is used to govern testing for all efforts. The plan is a required document, and once created, is updated only when an effort results in a change to the overall testing strategy for the solution.
		DIRM Apps Mgmt Team and Business Owner (UAT plan)	Test Plan (R*)	• DIRM IT Manager/ Project Manager
				• Business Owner (for UAT Plan only)

7.	**Update/Create Technical Test Cases and Automated Test Scripts**			
	• Assess and update or create test cases and the expected results for all technical testing categories defined in the Test Plan, except UAT, as appropriate. * Required if changes are to be made to the code.	DIRM Apps Mgmt Team	Technical Test Cases (R*) – Store in secure part of archive designated for the solution	• DIRM Technical Lead
	• Assess and update or create the automated test scripts as appropriate.	DIRM Apps Mgmt Team	Automated Test Scripts (S)	• DIRM Technical Lead

4.3.3 Build Step

The purpose of the Build Step is to code/build and test the solution; and update/create user, technical, and disaster recovery/business continuity documentation.

Deliverables in the Plan Step that are the basis of related deliverables in the Build Step (e.g., programming specifications for coding/building the solution) must be complete and accepted prior to commencing the related downstream work in the Build Step.

The activities of the Build Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

NOTE:

DIRM Applications Management Team staff and designated approvers must use the configuration management process and tool to check out, check in, and move code to the appropriate library throughout the Build Step process. For more detail, refer to the Configuration Management Process in Appendix D.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Code/Build Solution**			
	• Using the appropriate DIRM approved Configuration Management Process for the technology, check out the code.	DIRM Apps Mgmt Team	N/A	• N/A
	• Develop/code the solution.	DIRM Apps Mgmt Team	Solution Code (S)	• N/A
	• Use the appropriate configuration management process/tool for the platform to check in the code (see Appendix D).	DIRM Apps Mgmt Team	N/A	• N/A
	• Coordinate with DIRM IT Infrastructure, DIRM TSS, and/or OITS to install and validate new hardware and/or server side software as appropriate.	DIRM Apps Mgmt Team	Installed hardware/server side software (S)	• DIRM IT Manager
2.	**Conduct Unit Testing**			
	• Execute unit test of coded/configured solution changes and archive results in the folder designated for the effort. * Required if changes are to be made to the solution.	DIRM Apps Mgmt Team	Unit Test Findings/Results (R*) – store in secure part of archive designated for the solution	• DIRM Technical Lead
3.	**Perform Peer Review**			
	• Conduct peer review of coded/configured changes as requested by the DIRM IT Manager.	DIRM Apps Mgmt Team	Peer Review Checklist (S)	• DIRM Technical Lead

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
4.	**Execute Remaining Technical Testing**			
	• Execute technical (i.e., non-UAT) testing as defined in the Test Plan, document test findings and archive results in the folder designated for the effort. * Required if changes are to be made to the code.	DIRM Apps Mgmt Team	Technical Test Findings/Results (R*) – store in secure part of archive designated for the solution	• DIRM Technical Lead
	• Use the appropriate configuration management process/tool for the platform to promote the code to the UAT environment (see Appendix D).	DIRM Apps Mgmt Team	Configuration Management tool history of approval and promotion of code/build/release (R)	• As designated for the configuration management process
5.	**Execute User Acceptance Testing**			
	• Execute UAT as defined in the Test Plan and business developed test cases, and document test findings/problems identified, and retest fixes delivered by DIRM Apps Mgmt Team, updating findings as necessary to indicated passed results.	Business	UAT Problem Report Log (R) – store in secure part of archive designated for the solution	• N/A
	• Resolve problems identified during UAT, and conduct system and regression testing until test has passed prior to UAT retesting by the Business.	DIRM Apps Mgmt Team	UAT Problem Report Log (R) (updated) – store in secure part of archive designated for the solution	• N/A
	• Obtain User Acceptance of the solution.	DIRM Apps Mgmt Team	UAT Approval Form (R)	• Business Owner
6.	**Approve to Proceed to Implement Step**			
	• Obtains approval from the Business Owner to move forward with implementation on a specified date	DIRM IT Manager	Implementation Approval (R)	• Business Owner

4.3.4 Implement Step

The purpose of the Implement Step is to conduct training, install solution, update state Application Portfolio Management (APM) tool, and close out effort. Close out efforts include archiving effort documentation.

All deliverables and work products from the previous step must be complete and accepted prior to commencing work in the Implement Step. No migration to production can occur before the Business Owner officially signs off that the system as ready to implement.

The activities of the Implement Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

NOTE:

DIRM Applications Management Team staff and designated approvers must use the configuration management process and tool to check out, check in, and move code to the appropriate library throughout the Build Step process. For more detail, refer to the Configuration Management Process in Appendix D.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Update/Create Implementation Checklist**			
	• Assess and update or develop the Implementation Checklist as appropriate. This checklist ensures that all technical and functional required steps for migration to production are addressed.	DIRM Apps Mgmt Team	Implementation Checklist (R)	• DIRM IT Manager
2.	**Install/Rollout Solution**			
	• Using the configuration management tool, obtain approval and promote the code/build/release to the production environment.	Designated DIRM Apps Mgmt staff	Configuration Management tool history of approval and promotion of code/build/release (R)	• As designated for the configuration management process
3.	**Conduct Technical and Business Post Implementation Verification**			
	• Conduct technical post implementation review of the solution and completed Implementation Checklist to verify that all the appropriate production migration steps were successful.	DIRM Apps Mgmt Team	N/A	• DIRM Technical Lead
	• Conduct business post implementation review of production output (e.g., screens, reports, printed output, etc.; sample determined by business) within two business days of implementation or production execution, whichever is later.	Business Owner	N/A	• Business Owner to send notification to DIRM IT Manager/ DIRM Technical Lead

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
4.	**Update APM**			
	• Review the state's Application Portfolio Management tool and update the entry for the solution as appropriate.	DIRM IT Manager	APM Tool (updated) (S)	• N/A
5.	**Close out Effort**			
	• Validate that the ticket is resolved and all documentation, formal deliverables, handwritten notes, test results, etc. related to the effort in the archive designated for the solution/effort.	DIRM IT Manager or DIRM Technical Lead	N/A	• N/A

After the effort is closed out, the solution proceeds to the Operate Step for ongoing operations.

5. ENHANCEMENTS

5.1 Purpose

This section describes the DIRM SDLC process for the following classifications of IT efforts:

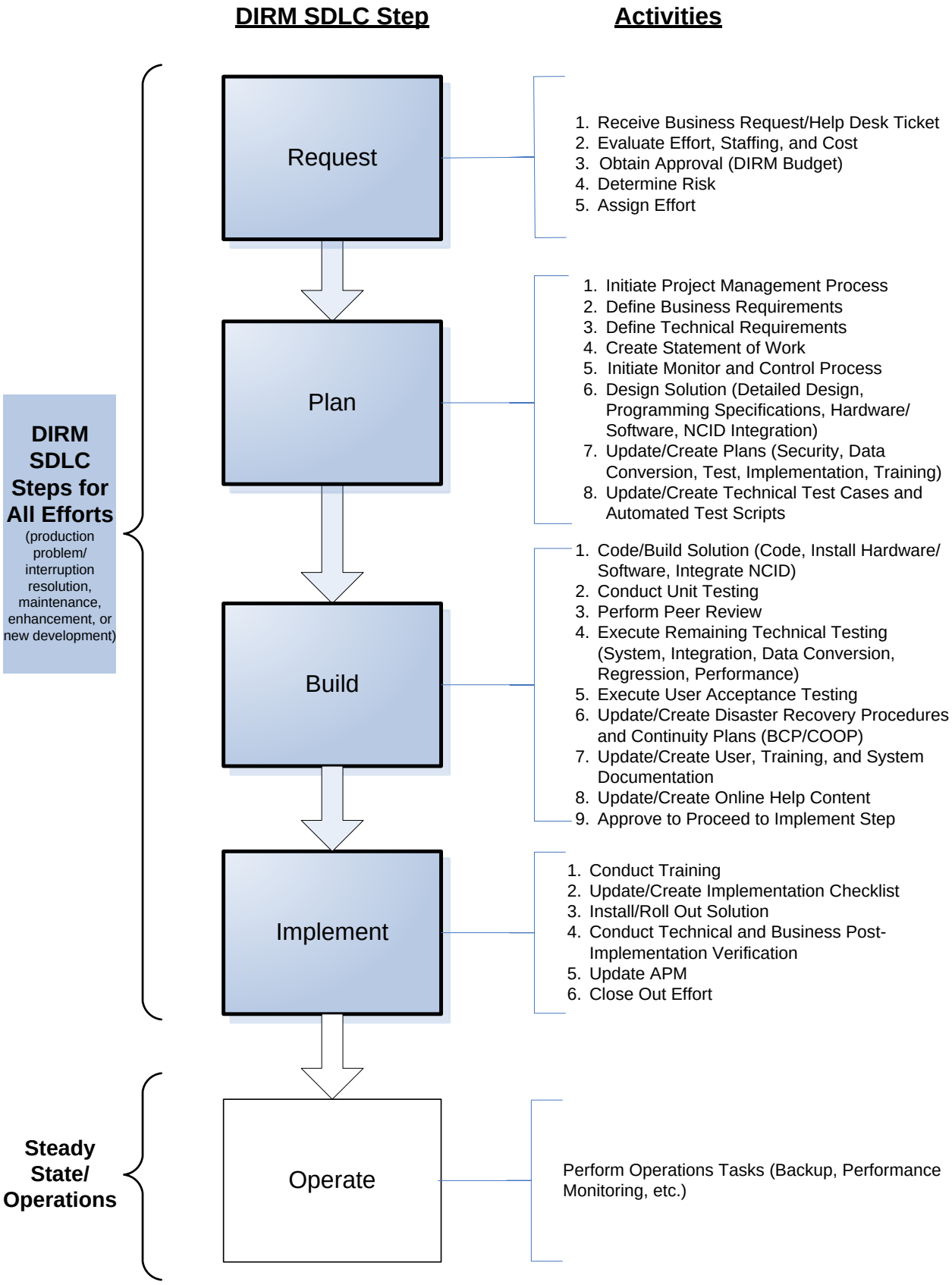
- A major enhancement
- A minor enhancement

An enhancement is the process of modifying a production application and/or component/solution after delivery (i.e., after initial development and implementation) intended to increase or decrease functionality and capability from the existing design. The change and/or addition to functionality and capability are not constrained by time and/or size of the effort, however, these factors, along with risk, influence classification as either a major or minor enhancement. Examples of an enhancement are provided in Appendix B.

5.2 Workflow

Figure 5 depicts the overall workflow of the DIRM SDLC Steps required for an enhancement effort. This workflow applies to all enhancements. Unless otherwise specified, all deliverables and work products from one DIRM SDLC Step must be complete and accepted prior to commencing work in the next DIRM SDLC Step; however, depending upon the scope of the effort and level of risk, some activities within a step may vary, and the activities can be completed in parallel.

Figure 5. DIRM SDLC Workflow for Enhancements



The details for each DIRM SDLC Step are provided in DIRM SDLC Steps. The details provided include:

- Activities
- Activity owners
- Associated deliverables and work products
- Deliverable/work product approvals

A consolidated deliverable/work product list for all effort categories is documented in Appendix E. The consolidated list provides a description of the document content and the required deliverables for each effort category.

5.3 DIRM SDLC Steps

5.3.1 Request Step

The purpose of the Request Step is to receive; approve; and evaluate effort for effort type classification, size (hours/cost), and risk level; and assign an effort to a DIRM Applications Management Team.

The activities of the Request Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Receive Business Request/Help Desk Ticket**			
	• Submit a completed and signed DIRM Enhancement Request Form to the appropriate help desk (e.g., DHHS CSC).	Designated Business Requester as designated by Division Director	DIRM Enhancement Request Form (R)	• Business Requester • Business Division Director • Business Budget Officer
	• Assign the help desk ticket to the DIRM IT Manager or DIRM Technical Lead for the solution.	DHHS CSC	Help Desk Ticket with request form attached (R)	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
2.	**Evaluate Effort, Staffing, and Cost Required**			

	• Confirm that the request is an enhancement.
	  • Yes, continue to use Enhancement SDLC.
	  • No, route the request/help desk ticket as appropriate for Production Incident Resolution, Maintenance, or New Development effort.
		DIRM IT Manager/DIRM Technical Lead	N/A	• N/A

	• Identify estimated IT infrastructure impacts (e.g., hardware, server side software, middleware, third-party software components, mainframe printers, connectivity, etc.) and notify management of the DIRM IT Infrastructure Section and/or DIRM Technical Support and Services (TSS) Unit as appropriate.	DIRM IT Manager/DIRM Technical Lead	N/A	• N/A
	• Create a ballpark Total Cost of Ownership estimate for effort. Work with DIRM IT Infrastructure Section and/or DIRM TSS Unit as appropriate for IT infrastructure costs.	DIRM IT Manager	N/A	• N/A

	• Ensuring that existing state staff are not over allocated such that normal forecasted work cannot be met, determine if effort can be delivered with existing state staff (i.e., without use of existing or new contractors) AND with existing funding (i.e., federal, state, etc.).
	  • Yes (i.e., no contract staff needed AND no new funds are needed) – proceed to **4. Determine Risk** activity.
	  • No (i.e., contract staff and/or new funding **is** needed) – DIRM IT Manager (only) forwards DIRM Enhancement Request Form and contract staffing requirements to the DIRM Budget Officer for review and proceed to **3. Obtain Approval – DIRM Budget** activity.
		DIRM IT Manager/DIRM Technical Lead (as noted in Activity column)	N/A	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
3.	**Obtain Approval – DIRM Budget**			

	• Work with business Budget Officer to identify funding sources and determine if additional funding sources have been identified that require a budget revision.
	  • Yes – Notify the DIRM IT Manager when the budget revision is approved.
	  • No (or budget revision not approved) – Proceed with part of the effort that does not require the funding needed, or if none, DIRM IT Manager or DIRM Technical Lead updates and resolves help desk ticket, and notifies Business Requester as appropriate.
		DIRM Budget Officer	N/A	• N/A

4.	**Determine Risk**			
	• Complete the DIRM SDLC Risk Evaluator located at (https://www.ncsurveymax.com/TakeSurvey.aspx?SurveyID=745I8p2) (survey ID is 745I8p2) and save a copy of the received from the DIRM SDLC Risk Evaluator to the archive designated for the solution/effort. Save additional results as well if the effort is re-evaluated at a later date.	DIRM IT Manager/DIRM Technical Lead	DIRM SDLC Risk Evaluation Tool Results (R)	• N/A
5.	**Assign Effort**			
	• Assign the effort to the appropriate DIRM Applications Management Team to commence the Plan Step.	DIRM IT Manager/DIRM Technical Lead	N/A	• N/A

5.3.2 Plan Step

The purpose of the Plan Step is to initiate monitor and control activities; gather and analyze requirements; define the Statement of Work and project schedule; design the solution; and develop plans needed to implement the solution.

All deliverables and work products from the previous step must be complete and accepted prior to commencing work in the Plan Step.

The activities of the Plan Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Initiate Project Management Process**			
	• If the enhancement effort is required to follow the SCIO PPM process, initiate project management activities and PPM status reporting as required per the Enterprise Project Management Office (EPMO).	DIRM Project Manager/DIRM Technical Lead	SCIO PPM Deliverables/ Reporting per TCO (S)	• Designated approvers in the Approval section of deliverables
2.	**Define Business Requirements**			
	• Document the detailed business requirements for the enhancement request. DIRM Applications Management Team may assist in identifying detailed business requirements.	Business Owner	Detailed Business Requirements Document (R)	• Business Owner (required to proceed with the effort)
3.	**Define Technical Requirements**			

	• Document the detailed technical requirements for the request as appropriate. Examples include:
	  • Operational requirements
	  • Data requirements
	  • Security
	  • System Interfaces
	  • Disaster recovery
	  • Hardware
	  • Software
	  Does not include items that will be documented in the programming specifications.
	* For minor enhancements, DIRM IT Manager may determine that technical requirements can be documented in the SOW.
		DIRM Apps Mgmt Team	Detailed Technical Requirements Document (for minor enhancements, can be documented in SOW) (S)	• DIRM IT Manager

	• Update the existing Requirements Traceability Matrix throughout the effort to trace functional requirements through to design, test, and implementation. * Required if an RTM has already been documented for the production solution being enhanced.	DIRM Apps Mgmt Team	Requirements Traceability Matrix (R*)	• DIRM Technical Lead

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
4.	**Create Statement of Work**			
	• Create a Statement of Work (SOW).	DIRM IT Manager/DIRM Technical Lead	Simplified Statement of Work (minor enhancements) (R) Statement of Work (major enhancements) (R)	• DIRM IT Manager • Business Owner (final formal approval)
5.	**Initiate Monitor and Control Process (See Appendix C)**			
	• Work with the business to develop the Detailed Schedule/Work Plan, and update throughout the effort life cycle. * No template is provided for the Detailed Schedule/Work Plan as the details of this deliverable are unique to the scope and nature of the individual effort. The key components of the Detailed Schedule/Work Plan are provided in Appendix E. Major enhancements are required to use Microsoft Project.	DIRM IT Manager/DIRM Technical Lead or Project Manager	Detailed Schedule / Work Plan (R*)	• DIRM IT Manager • Business Owner
	• Initiate status reporting to the business, to include at a minimum: tasks completed in cycle, tasks planned next cycle, issues, and risks. Biweekly reporting is recommended unless another schedule is negotiated with the business.	DIRM IT Manager/DIRM Technical Lead or Project Manager	Effort Status Report (R)	• N/A
	• Document, track and escalate or mitigate issues and risks when identified for the effort throughout the effort life cycle. Also track any changes made to the effort via approved change requests (see below). This log is used only when issues, risks or changes are identified for the effort.	DIRM IT Manager/DIRM Technical Lead or Project Manager	Monitor and Control Log (S)	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Document change requests (CR) identified throughout the effort life cycle as needed. Change requests can be identified by the DIRM Applications Management Team or the Business Owner. The DIRM IT Manager or DIRM Technical Lead must perform an impact analysis that includes updating deliverables appropriately and repeating the DIRM SDLC Risk Evaluator if the CR includes a change in scope. * Use the Change Request form (and update the Monitor and Control Log) to document changes that impact the scope, timeline, and/or budget of the effort. For changes with no scope, timeline, or budget impact, document the change on the Change Request Log tab of the Monitor and Control Log.	Business Owner and/or Project Manager/DIRM IT Manager/ DIRM Technical Lead	Change Request Form(s) (S*)	• DIRM IT Manager • DIRM Budget Officer (for budget changes only) • Business Owner
	• Manage vendors and amend contracts as appropriate throughout the effort lifecycle.	DHHS Contract Administrator	Amended contract (S)	• Vendor Contract Administrator • DHHS Contract Administrator
	• Monitor the delivery, approval of and updates to deliverables throughout the effort lifecycle.	DIRM IT Manager/DIRM Technical Lead or Project Manager	Deliverable Approval forms (R)	• Designated approvers per the SDLC.
	• Monitor the use of the DIRM approved configuration management process/tool appropriate for the platform throughout the effort lifecycle (see Appendix D).	DIRM IT Manager	Configuration Management tool history (R)	• As designated for the configuration management process

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
6.	**Design Solution**			
	• If reporting to the SCIO and TCO ≥ $500K, create and update throughout the effort the state Technical Architecture and System Design document.	DIRM Apps Mgmt Team	Technical Architecture and System Design Document (R for SCIO reporting efforts with TCO ≥ $500K)	• DHHS Chief Technical Architect • DIRM Technical Lead • Person submitting to the PPM tool – signature captured through submission
	• Assess and update or create the detailed design of the solution as appropriate to accommodate at a detailed level all functional and non-functional processes for the solution. To include user interface screens/web forms, reports and/or form layouts, as well as the data dictionary (can be auto generated) and data maps as appropriate. , Assure that the design complies with the Statewide Information Security Manual. DIRM IT Manager will determine if architectural changes resulting from enhancements require review by the DHHS Chief Technical Architect.	DIRM Apps Mgmt Team	Detailed Design Document (R) Data Dictionary (S) Data Mapping (S)	• DIRM IT Manager/ DIRM Technical Lead
	• Create programming specifications needed to code the change to the solution, assuring compliance with the Statewide Information Security Manual.	DIRM Apps Mgmt Team	Programming Specifications (R)	• DIRM IT Manager/ DIRM Technical Lead

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• In accordance with the DIRM IT Infrastructure, DIRM TSS, and/or OITS procedures, coordinate to request and purchase new hardware, and/or server side software as appropriate.	DIRM Apps Mgmt Team	Linux Service Account Linux User ID; Server Farm Request OITS Hosting Services – New Project/Server Client Questionnaire, Solaris/AIX OITS Hosting Services – New Project/Server Client Questionnaire OITS Server Farm Request OITS Server Farm Request Form Other OITS forms as appropriate (S)	• As specified on form
	• In accordance with OITS procedures, coordinate to perform NCID integration as appropriate.	DIRM Apps Mgmt Team	Appropriate Applications Integration to NCID form (S)	• As specified on form
7.	**Update/Create Plans**			
	• Provide updates to the Business Information Security Officer for the Security Plan as appropriate.	Business Information Security Official	Security Plan (S) – store in secure part of archive designated for the solution	• As defined by the Business
	• Assess and update or create the Data Conversion Plan as appropriate.	DIRM Apps Mgmt Team/DIRM DBA	Data Conversion Plan (S)	• DIRM IT Manager • Business Owner

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals

	• Assess and update or create the Test Plan as appropriate. The test categories are (R = required; S = scope dependent):
	  • Technical Testing
	  – Unit Testing (R)
	  – System and Regression Testing (R)
	  – Interface Testing (S)
	  – Data Conversion Testing (S)
	  – Security Testing (S)
	  – Performance Testing (i.e., including load and stress) (S)
	  • Functional Testing
	  – User Acceptance Testing (UAT) (R) **NOTE:** This document will contain only the plan for UAT; all UAT Test Case development and UAT testing are the responsibility of the Business Owner.
	*The Test Plan is a strategic document that is required for the solution and is used to govern testing for all efforts. The plan is a required document, and once created, is updated only when an effort results in a change to the overall testing strategy for the solution.
		DIRM Apps Mgmt Team and Business Owner (UAT plan)	Test Plan (R*)	• DIRM IT Manager/ Project Manager
				• Business Owner (for UAT Plan only)

	• Assess and update or create the Implementation Plan, including contingency/rollback plans, as appropriate.	DIRM Apps Mgmt Team	Simplified Implementation Plan (R)	• DIRM IT Manager • Business Owner
	• Assess and update or create the Training Plan as appropriate.	Business Owner unless otherwise specified in the SOW and Detailed Schedule/Work Plan	Training Plan (S)	• As defined by the Business
8.	**Update/Create Technical Test Cases and Automated Test Scripts**			
	• Assess and update or create test cases and the expected results for all technical testing categories defined in the Test Plan, except UAT, as appropriate.	DIRM Apps Mgmt Team	Technical Test Cases (R) – Store in secure part of archive designated for the solution	• DIRM Technical Lead

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Assess and update or create automated test scripts as appropriate.	DIRM Apps Mgmt Team	Automated Test Scripts (S)	• DIRM Technical Lead

5.3.3 Build Step

The purpose of the Build Step is to code/build and test the solution; and update/create user, technical, and disaster recovery/business continuity documentation.

Deliverables in the Plan Step that are the basis of related deliverables in the Build Step (e.g., programming specifications for coding/building the solution) must be complete and accepted prior to commencing the related downstream work in the Build Step.

The activities of the Build Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

NOTE:

DIRM Applications Management Team staff and designated approvers must use the configuration management process and tool to check out, check in, and move code to the appropriate library throughout the Build Step process. For more detail, refer to the Configuration Management Process in Appendix D.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Code/Build Solution**			
	• Using the appropriate DIRM approved Configuration Management Process for the technology, check out the code.	DIRM Apps Mgmt Team	N/A	• N/A
	• Develop/code the solution.	DIRM Apps Mgmt Team	Solution Code (R)	• N/A
	• Use the appropriate configuration management process/tool for the platform to check in the code (see Appendix D).	DIRM Apps Mgmt Team	N/A	• N/A
	• Coordinate with DIRM IT Infrastructure, DIRM TSS, and/or OITS to install and validate new hardware and/or software as appropriate.	DIRM Apps Mgmt Team	Installed hardware/server side software (S)	• DIRM IT Manager

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Coordinate with OITS to integrate the solution with NCID as appropriate.	DIRM Apps Mgmt Team	NCID integration (S)	• DIRM IT Manager
2.	**Conduct Unit Testing**			
	• Execute unit test of coded/configured solution changes and archive results in the folder designated for the effort.	DIRM Apps Mgmt Team	Unit Test Findings/Results (R) – store in secure part of archive designated for the solution	• DIRM Technical Lead
3.	**Perform Peer Review**			
	• Conduct peer review of coded/configured changes as requested by the DIRM IT Manager.	DIRM Apps Mgmt Team	Peer Review Checklist (S)	• DIRM Technical Lead
4.	**Execute Remaining Technical Testing**			
	• Execute technical (i.e., non-UAT) testing as defined in the Test Plan, document test findings and archive results in the folder designated for the effort.	DIRM Apps Mgmt Team	Technical Test Findings/Results (R) – store in secure part of archive designated for the solution	• DIRM Technical Lead
	• Use the appropriate configuration management tool/process to move the code to the UAT library and promote the code/build/release to the UAT environment (see Appendix D).	DIRM Apps Mgmt Team	Configuration Management tool history and promotion of code/build/release (R)	• As designated for the configuration management process
5.	**Execute User Acceptance Testing**			
	• Execute UAT as defined in the Test Plan and business developed test cases, and document test findings/problems identified, and retest fixes delivered by DIRM Apps Mgmt Team, updating findings as necessary to indicated passed results.	Business	UAT Problem Report Log (R) – store in secure part of archive designated for the solution	• N/A
	• Resolve problems identified during UAT, and conduct system and regression testing until test has passed prior to UAT retesting by the Business.	DIRM Apps Mgmt Team	UAT Problem Report Log (R) (updated) – store in secure part of archive designated for the solution	• N/A
	• Obtain User Acceptance of the solution.	DIRM Apps Mgmt Team	UAT Approval Form (R)	• Business Owner

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
6.	**Update/Create Disaster Recovery Procedures and Continuity Plans (BCP/COOP)**			
	• Update the solution's Disaster Recovery (DR) Plan as appropriate.	DIRM Apps Mgmt Team	Disaster Recovery Plan (S) – store in secure part of archive designated for the solution	• DIRM IT Manager • Business Owner
	• Provide information needed for the DIRM Information Security Officer (ISO) to update the DIRM Continuity of Operations Plan (COOP) as appropriate (i.e., based on system criticality) if DR Procedures have changed.	DIRM IT Manager	Template provided by DIRM ISO	• N/A
	• Provide revised DR Plan data to the Business Owner for updates to the Business Continuity Plan (BCP) in the state's Living Disaster Recovery Planning System (LDRPS) as appropriate.	DIRM IT Manager/DIRM Technical Lead	Template provided by Business ISO (S)	• N/A
7.	**Update User, Training, and System Documentation**			
	• Update the Training Manual and/or Training Materials as appropriate.	Business Owner unless otherwise specified in the SOW	Training Manual/Materials (S)	• As defined by the Business
	• Update the User Manual as appropriate.	Business Owner unless otherwise specified in the SOW	User Manual/help documentation (S)	• As defined by the Business
	• Update system documentation as appropriate.	DIRM Apps Mgmt Team	System Documentation (S)	• DIRM Technical Lead
8.	**Update Online Help Content**			
	• Update online help content for the solution as appropriate.	Business Owner unless otherwise specified in the SOW	Online Help Content (S)	• As defined by the Business
9.	**Approve to Proceed to Implement Step**			
	• Obtain approval from the Business Owner to move forward with implementation on a specified date.	DIRM IT Manager/DIRM IT Director	Implementation Approval (R)	• Business Owner

5.3.4 Implement Step

The purpose of the Implement Step is to conduct training, install solution, update state Application Portfolio Management (APM) tool, and close out effort. Close out efforts include archiving effort documentation.

All deliverables and work products from the previous step must be complete and accepted prior to commencing work in the Implement Step. No migration to production can occur before the Business Owner officially signs off that the system as ready to implement.

The activities of the Implement Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

NOTE:

DIRM Applications Management Team staff and designated approvers must use the configuration management process and tool to check out, check in, and move code to the appropriate library throughout the Build Step process. For more detail, refer to the Configuration Management Process in Appendix D.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Conduct Training**			
	• Conduct end user training, as appropriate. *DIRM Applications Management Team conducts technical training as appropriate.	Business Owner unless otherwise specified in the SOW and Detailed Schedule/Work Plan*	Training attendance list or appropriate training report and training surveys (S)	• N/A
2.	**Update/Create Implementation Checklist**			
	• Assess and update or develop the Implementation Checklist as appropriate. This checklist ensures that all technical and functional required steps for migration to production are addressed.	DIRM Apps Mgmt Team	Implementation Checklist (R)	• DIRM IT Manager
3.	**Install/Rollout Solution**			
	• Using the configuration management tool, obtain approval and promote the code/build/release to the production environment.	Designated DIRM Apps Mgmt staff	Configuration Management tool history of approval and promotion of code/build/release (R)	• As designated for the configuration management process

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
4.	**Conduct Technical and Business Post Implementation Verification**			
	• Conduct technical post implementation review of the solution and completed Implementation Checklist to verify that all the appropriate production migration steps were successful.	DIRM Apps Mgmt Team	N/A	• DIRM Technical Lead
	• Conduct business post implementation review of production output (e.g., screens, reports, printed output, etc.; sample determined by business) within two business days of implementation or production execution, whichever is later.	Business Owner	N/A	• Business Owner to send notification to DIRM IT Manager/ DIRM Technical Lead
5.	**Update APM**			
	• Review the state's Application Portfolio Management tool and update the entry for the solution as appropriate.	DIRM IT Manager	APM Tool (updated) (S)	• N/A
6.	**Close out Effort**			
	• Validate that the ticket is resolved and all documentation, formal deliverables, handwritten notes, test results, etc. related to the effort in the archive designated for the solution/effort.	DIRM IT Manager or DIRM Technical Lead	N/A	• N/A

After the effort is closed out, the solution proceeds to the Operate Step for ongoing operations.

6. NEW DEVELOPMENT

6.1 Purpose

This section describes the DIRM SDLC process for the following classifications of IT efforts:

- A major new development effort with a Total Cost of Ownership ≥ $100K
- A minor new development effort with a Total Cost of Ownership < $100K

NOTE:

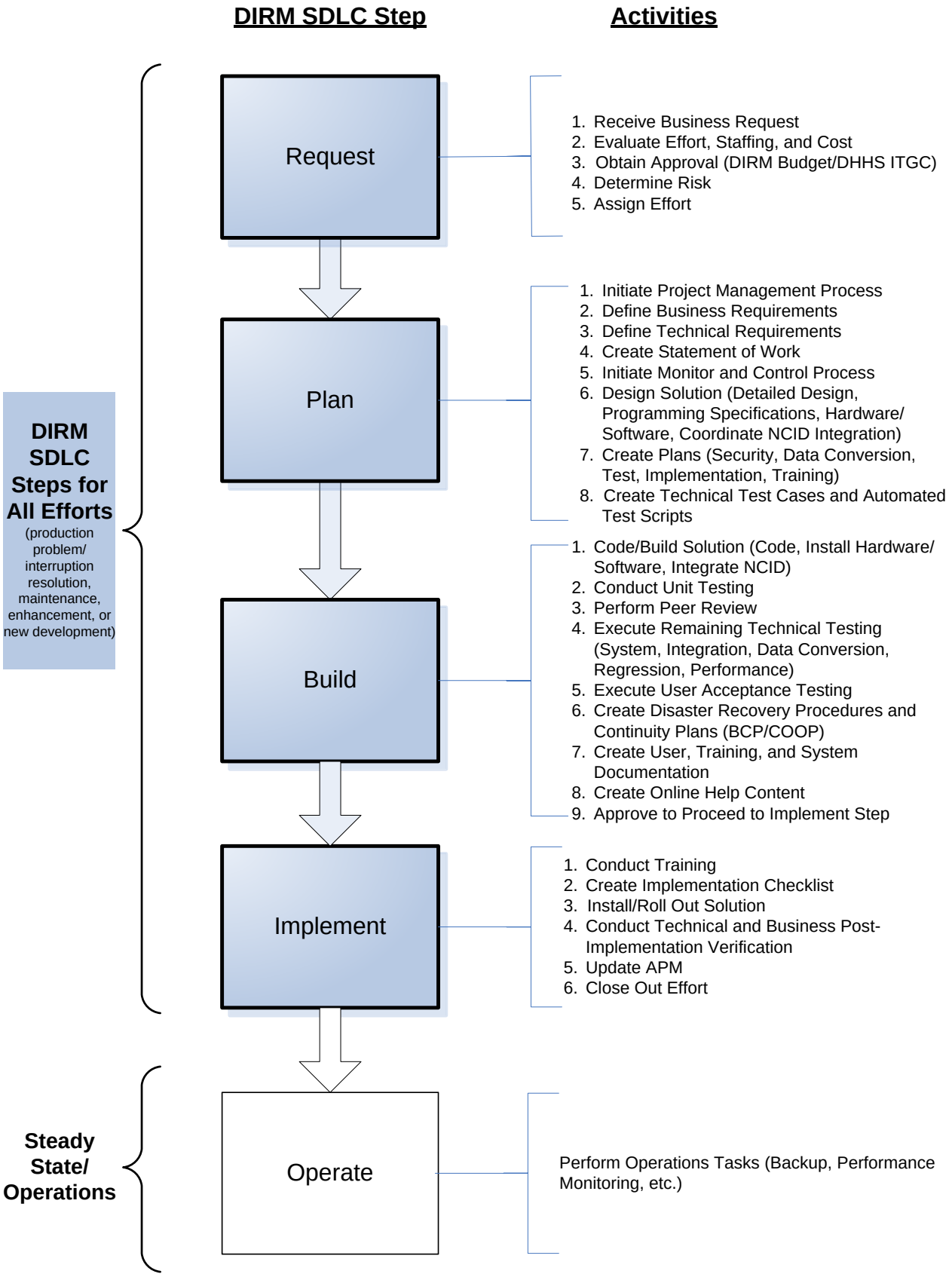
New developments efforts with a TCO ≥ $100K must adhere the Project Portfolio Management process maintained by the state's Enterprise Project Management Office (EPMO).

New development addresses the creation of a software solution that provides new automation for a business process, provides business relief and/or address a critical time-sensitive need. New development efforts that cost $100K or more to develop and maintain for five years must obtain approval by both the DHHS ITGC and the SCIO before DIRM can begin Plan activities. Examples of a new development effort are provided in Appendix B.

6.2 Workflow

Figure 6 depicts the overall workflow of the DIRM SDLC Steps required for a new development effort. This workflow applies to all new development efforts. Unless otherwise specified, all deliverables and work products from one DIRM SDLC Step must be complete and accepted prior to commencing work in the next DIRM SDLC Step; however, depending upon the scope of the effort and level of risk, some activities within a step may vary, and the activities can be completed in parallel.

Figure 6. DIRM SDLC Workflow for New Development



The details for each DIRM SDLC Step are provided in DIRM SDLC Steps. The details provided include:

- Activities
- Activity owners
- Associated deliverables and work products
- Deliverable/work product approvals

A consolidated deliverable/work product list for all effort categories is documented in Appendix E. The consolidated list provides a description of the document content and the required deliverables for each effort category.

6.3 DIRM SDLC Steps

6.3.1 Request Step

The purpose of the Request Step is to receive; approve; and evaluate effort for effort type classification, size (hours/cost), and risk level; and assign an effort to a DIRM Applications Management Team.

The activities of the Request Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Receive Business Request**			
	• Work with supporting IT Director/Manager(s) to prepare the proposal and budget using the DHHS ITGC forms located at http://www.ncdhhs.gov/budgetandanalysis/itgovernance.htm. The DIRM IT Manager can provide assistance upon request.	Designated Business Requester	ITGC Request to Pursue New Initiative ITGC Application Budget Supplement (R)	• Division Director • Division Budget Officer • Business Requester
2.	**Evaluate Effort, Staffing, and Cost Required**			
	• Identify estimated IT infrastructure impacts (e.g., hardware, server side, middleware, third-party software components, mainframe printers, connectivity, etc.) and notify management of the DIRM IT Infrastructure Section and/or DIRM Technical Support and Services (TSS) Unit as appropriate.	Designated Business Requester	N/A	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Open a help desk ticket and validate the ballpark Total Cost of Ownership estimated for effort. Work with DIRM IT Infrastructure Section and/or DIRM TSS Unit as appropriate for IT infrastructure costs.	DIRM IT Manager	N/A	• N/A

	TCO < $100K
	• Ensuring that existing state staff are not over allocated such that normal forecasted work cannot be met, determine if effort can be delivered with existing state staff (i.e., without use of existing or new contractors) AND with existing funding (if applicable).
	  • Yes (i.e., no contract staff needed AND no new funds are needed) – proceed to **4. Determine Risk** activity.
	  • No (i.e., contract staff and/or new funding **is** needed) – DIRM IT Manager (only) forwards DIRM Enhancement Request Form and contract staffing requirements to the DIRM Budget Officer for review and proceed to **3.a Obtain Approval – DIRM Budget** activity.
		DIRM IT Manager/DIRM Technical Lead (as noted in Activity column)	N/A	• N/A

	TCO ≥ $100K • Proceed to **3.b Obtain Approval – DHHS ITGC** activity.	N/A	N/A	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
3	**Obtain Approval**			
	3.a. Obtain Approval – DIRM Budget (TCO < $100K)			

	• Work with business Budget Officer to identify funding sources and determine if additional funding sources have been identified that require a budget revision.
	  • Yes – Notify the DIRM IT Manager when the budget revision is approved.
	  • No (or budget revision not approved) – Proceed with part of the effort that does not require the funding needed, or if none, DIRM IT Manager or DIRM Technical Lead updates and resolves help desk ticket, and notifies the Business Requester as appropriate.
		DIRM Budget Officer	N/A	• N/A

	3.b. Obtain Approval – DHHS ITGC (TCO ≥ $100K)			

	• Present proposal for DHHS ITGC approval determination.
	  • Approved: DHHS CIO Office forwards request to designated DIRM IT Manager for the solution.
	  • Not Approved: No further action on current proposal.
		Business	Memorandum of Approval (R major new development)	• DHHS ITGC

4.	**Determine Risk**			
	• Complete the DIRM SDLC Risk Evaluator located at (https://www.ncsurveymax.com/TakeSurvey.aspx?SurveyID=745I8p2) (survey ID is 745I8p2) and save a copy of the received from the DIRM SDLC Risk Evaluator to the archive for the solution/effort. Save additional results as well if the effort is re-evaluated at a later date.	DIRM IT Manager/DIRM Technical Lead	DIRM SDLC Risk Evaluation Tool Results (R)	• N/A

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
5.	**Assign Effort**			
	• Open a help desk ticket with the DHHS Customer Support Center (CSC) and assign the effort to the appropriate DIRM Applications Management Team to commence the Plan Step.	DIRM IT Manager/DIRM Technical Lead	Help Desk Ticket (R)	• N/A

6.3.2 Plan Step

The purpose of the Plan Step is to initiate monitor and control activities; gather and analyze requirements; define the Statement of Work and project schedule; design the solution; and develop plans needed to implement the solution.

All deliverables and work products from the previous step must be complete and accepted prior to commencing work in the Plan Step.

The activities of the Plan Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Initiate Project Management Process**			
	• If the new development effort is required to follow the SCIO PPM process, initiate project management activities and PPM status reporting as required per the Enterprise Project Management Office (EPMO).	Project Manager	SCIO PPM Deliverables/ Reporting per TCO (S)	• Designated approvers in the Approval section of deliverables
2.	**Define Business Requirements**			
	• Document the detailed business requirements for the new development request. DIRM Applications Management Team may assist in identifying detailed business requirements.	Business Owner	Detailed Business Requirements Document (R)	• Business Owner/Effort Sponsor (required to proceed with the effort)

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
3.	**Define Technical Requirements**			

	• Document the detailed technical requirements for the request as appropriate. Examples include:
	  • Operational requirements
	  • Data requirements
	  • Security
	  • System Interfaces
	  • Disaster recovery
	  • Hardware
	  • Software
	Does not include items that will be documented in the programming specifications.
		DIRM Apps Mgmt Team	Detailed Technical Requirements Document (S)	• DIRM IT Manager/ Project Manager

	• Create the Requirements Traceability Matrix (RTM) for the solution and update throughout the effort to trace functional requirements through to design, test, and implementation.	DIRM Apps Mgmt Team	Requirements Traceability Matrix (R)	• Project Manager/ DIRM Technical Lead
4.	**Create Statement of Work**			
	• Create a Statement of Work (SOW).	Project Manager/ DIRM IT Manager/DIRM Technical Lead	Statement of Work (R)	• DIRM IT Manager/ Project Manager • Business Owner (final formal approval)
5.	**Initiate Monitor and Control Process (See Appendix C)**			
	• Work with the business to develop the Detailed Schedule/Work Plan, and update throughout the effort life cycle. * No template is provided for the Detailed Schedule/Work Plan as the details of this deliverable are unique to the scope and nature of the individual effort. The key components of the Detailed Schedule/Work Plan are provided in Appendix E. Use of Microsoft Project is required.	Project Manager/ DIRM IT Manager/DIRM Technical Lead	Detailed Schedule / Work Plan (R*)	• DIRM IT Manager/ Project Manager/ DIRM Technical Lead • Business Owner

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Initiate status reporting to the business, to include at a minimum: tasks completed in cycle, tasks planned next cycle, issues, and risks. Biweekly reporting is recommended unless another schedule is negotiated with the business.	Project Manager/ DIRM IT Manager/DIRM Technical Lead	Effort Status Report (R)	• N/A
	• Document, track and escalate or mitigate issues and risks when identified for the effort throughout the effort life cycle. Also track any changes made to the effort via approved change requests (see below). This log is used only when issues, risks or changes are identified for the effort. *Efforts that report to the State CIO use the state's PPM process.	Project Manager/ DIRM IT Manager/DIRM Technical Lead	Monitor and Control Log (S)	• N/A
	• Document change requests (CR) identified throughout the effort life cycle as needed. Change requests can be identified by the DIRM Applications Management Team or the Business Owner. The DIRM IT Manager or DIRM Technical Lead must perform an impact analysis that includes updating deliverables appropriately and repeating the DIRM SDLC Risk Evaluator if the CR includes a change in scope. *Efforts that report to the State CIO use the state's PPM process.	Business Owner and/or Project Manager/DIRM IT Manager/ DIRM Technical Lead	Change Request Form(s) (S*)	• DIRM IT Manager/ Project Manager • DIRM Budget Officer (for budget changes) • Business Owner
	• Manage vendors and amend contracts as appropriate throughout the effort lifecycle.	DHHS Contract Administrator	Amended contract (S)	• DHHS Contract Administrator • Vendor Contract Administrator
	• Draft and finalize according to the timeline new Service Level Agreement (SLA) with vendor(s) as appropriate.	DIRM IT Manager/Project Manager	Service Level Agreement (S) This document is to be stored with the DIRM Vendor Management Section	• DIRM Director • Representative from vendor(s)

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Monitor the delivery, approval of and updates to deliverables throughout the effort lifecycle.	Project Manager/ DIRM IT Manager/DIRM Technical Lead	Deliverable Approval forms (R)	• Designated approvers per the SDLC.
	• Monitor the use of the DIRM approved configuration management process/tool appropriate for the platform throughout the effort lifecycle (see Appendix D).	DIRM IT Manager	Configuration Management tool history (R)	• As designated for the configuration management process
6.	**Design Solution**			
	• If TCO ≥ $500K, create and update throughout the effort the state Technical Architecture and System Design document.	DIRM Apps Mgmt Team	Technical Architecture and System Design Document (R for new development with TCO ≥ $500K)	• DHHS Chief Technical Architect • DIRM Technical Lead • Person submitting to the PPM tool – signature captured through submission
	• Create the detailed design of the solution as appropriate to accommodate at a detailed level all functional and non-functional processes for the solution. To include user interface screens/web forms, reports and/or form layouts, and data dictionary (can be auto generated) as well as data mapping documentation as appropriate. Assure that the design complies with the Statewide Information Security Manual.	DIRM Apps Mgmt Team	Detailed Design (R) Data Dictionary (R) Data Mapping document (S)	• DIRM IT Manager/ Project Manager/ DIRM Technical Lead
	• Create programming specifications needed to code the solution, assuring compliance with the Statewide Information Security Manual.	DIRM Apps Mgmt Team	Programming Specifications (R)	• DIRM IT Manager/ DIRM Technical Lead

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• In accordance with the DIRM IT Infrastructure, DIRM TSS, and/or OITS procedures, coordinate to request and purchase new hardware, and/or server side software as appropriate. NOTE: a hosting exception must be approved by the SCIO if the solution will not be hosted by the state.	DIRM IT Manager/Project Manager	Linux Service Account Linux User ID; Server Farm Request OITS Hosting Services – New Project/Server Client Questionnaire, Solaris/AIX OITS Hosting Services – New Project/Server Client Questionnaire OITS Server Farm Request OITS Server Farm Request Form Other OITS forms as appropriate (R as appropriate for the platform)	• As specified on form
	• In accordance with OITS procedures, coordinate to perform NCID integration as appropriate for solutions with user login. NOTE: an NCID exception must be approved by the SCIO if another authentication and authorization solution will be used.	DIRM IT Manager/Project Manager	Appropriate Applications Integration to NCID form (R for major development; S for minor development)	• As specified on form
7.	**Create Plans**			
	• Create the Security Plan, obtaining input from the DIRM Applications Management Team as appropriate.	Business Information Security Official	Security Plan (R) – store in secure part of archive designated for the solution	• As defined by the Business
	• Create the Data Conversion Plan as appropriate.	DIRM Apps Mgmt Team/DIRM DBA	Data Conversion Plan (S)	• DIRM IT Manager/ Project Manager • Business Owner

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals

	• Create the Test Plan as appropriate. The test categories are (R = required; S = scope dependent):
	  • Technical Testing
	  – Unit Testing (R)
	  – System and Regression Testing (R)
	  – Interface Testing (S)
	  – Data Conversion Testing (S)
	  – Security Testing (R for new development)
	  – Performance Testing (i.e., including load and stress) (S)
	  • Functional Testing
	  – User Acceptance Testing (UAT) (R) **NOTE:** This document will contain only the plan for UAT; all UAT Test Case development and UAT testing are the responsibility of the Business Owner.
		DIRM Apps Mgmt Team and Business Owner (UAT plan)	Test Plan (R)	• DIRM IT Manager/ Project Manager
				• Business Owner (for UAT Plan only)

	• Create the Implementation Plan, including contingency/rollback plans, as appropriate.	DIRM Apps Mgmt Team	Implementation Plan (R)	• DIRM IT Manager/ Project Manager • Business Owner
	• Create the Training Plan as appropriate.	Business Owner unless otherwise specified in the SOW and Detailed Schedule/Work Plan	Training Plan (S)	• As defined by the Business
8.	**Create Technical Test Cases and Automated Test Scripts**			
	• Create test cases and the expected results for all technical testing categories defined in the Test Plan, except UAT, as appropriate.	DIRM Apps Mgmt Team	Technical Test Cases (R) – Store in secure part of archive designated for the solution	• DIRM Technical Lead
	• Create automated test scripts as appropriate.	DIRM Apps Mgmt Team	Automated Test Scripts (S)	• DIRM Technical Lead

6.3.3 Build Step

The purpose of the Build Step is to code/build and test the solution; and update/create user, technical, and disaster recovery/business continuity documentation.

Deliverables in the Plan Step that are the basis of related deliverables in the Build Step (e.g., programming specifications for coding/building the solution) must be complete and accepted prior to commencing the related downstream work in the Build Step.

The activities of the Build Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

NOTE:

DIRM Applications Management Team staff and designated approvers must use the configuration management process and tool to check out, check in, and move code to the appropriate library throughout the Build Step process. For more detail, refer to the Configuration Management Process in Appendix D.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Code/Build Solution**			
	• Coordinate with DIRM IT Infrastructure, DIRM TSS, and/or OITS to install and validate new hardware and/or server side software as appropriate.	DIRM Apps Mgmt Team	Installed hardware/ server side software (S)	• DIRM IT Manager/ Project Manager
	• Coordinate with OITS to integrate the solution with NCID as appropriate.	DIRM Apps Mgmt Team	NCID integration (S)	• DIRM IT Manager/ Project Manager
	• Using the appropriate DIRM approved Configuration Management Process for the technology, check out the code.	DIRM Apps Mgmt Team	N/A	• N/A
	• Develop/code the solution.	DIRM Apps Mgmt Team	Solution Code (R)	• N/A
	• Use the appropriate configuration management process/tool for the platform to check in the code (see Appendix D).	DIRM Apps Mgmt Team	N/A	• N/A
2.	**Conduct Unit Testing**			
	• Execute unit test of coded/configured solution changes and archive results in the folder designated for the effort.	DIRM Apps Mgmt Team	Unit Test Findings/Results (R) – store in secure part of archive designated for the solution	• DIRM Technical Lead

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
3.	**Perform Peer Review**			
	• Conduct peer review of coded/configured changes as requested by the DIRM IT Manager.	DIRM Apps Mgmt Team	Peer Review Checklist (S)	• DIRM Technical Lead
4.	**Execute Remaining Technical Testing**			
	• Execute technical (i.e., non-UAT) testing as defined in the Test Plan, document test findings and archive results in the folder designated for the effort.	DIRM Apps Mgmt Team	Technical Test Findings/Results (R) – store in secure part of archive designated for the solution	• DIRM IT Manager/Project Manager/ DIRM Technical Lead
	• Use the appropriate configuration management tool/process to move the code to the UAT library and promote the code/build/release to the UAT environment (see Appendix D).	DIRM Apps Mgmt Team	Configuration Management tool history and promotion of code/build/release (R)	• As designated for the configuration management process
5.	**Execute User Acceptance Testing**			
	• Execute UAT as defined in the Test Plan and business developed test cases, and document test findings/problems identified, and retest fixes delivered by DIRM Apps Mgmt Team, updating findings as necessary to indicated passed results.	Business	UAT Problem Report Log (R) – store in secure part of archive designated for the solution	• N/A
	• Resolve problems identified during UAT, and conduct system and regression testing until test has passed prior to UAT retesting by the Business.	DIRM Apps Mgmt Team	UAT Problem Report Log (R) (updated) – store in secure part of archive designated for the solution	• N/A
	• Obtain User Acceptance of the solution.	Project Manager/DIRM Apps Mgmt Team	UAT Approval Form (R)	• Business Owner
6.	**Update/Create Disaster Recovery Procedures and Continuity Plans (BCP/COOP)**			
	• Create the solution's Disaster Recovery (DR) Plan.	DIRM Apps Mgmt Team	Disaster Recovery Plan (R) – store in secure part of archive designated for the solution	• DIRM IT Manager/ Project Manager • Business Owner

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Provide information needed for the DIRM ISO to update the DIRM Continuity of Operations Plan (COOP) as appropriate (i.e., based on system criticality).	DIRM IT Manager	Template provided by DIRM Information Security Official (S)	• N/A
	• Provide DR Plan data to the Business Owner for updates to the Business Continuity Plan (BCP) in LDRPS as appropriate.	DIRM IT Manager/DIRM Technical Lead	Template provided by Business Information Security Official (S)	• N/A
7.	**Create User, Training, and System Documentation**			
	• Create the Training Manual and/or Training Materials as appropriate.	Business Owner unless otherwise specified in the SOW	Training Manual/Materials (S)	• As defined by the Business
	• Create the User Manual as appropriate.	Business Owner unless otherwise specified in the SOW	User Manual/help documentation (S)	• As defined by the Business
	• Create system documentation as necessary for support operations.	DIRM Apps Mgmt Team	System Documentation (S)	• DIRM IT Manager/ Project Manager/ DIRM Technical Lead
8.	**Create Online Help Content**			
	• Create online help content for the solution as appropriate.	Business Owner unless otherwise specified in the SOW	Online Help Content (S)	• As defined by the Business
9.	**Approve to Proceed to Implement Step**			
	• Obtain approval from the Business Owner to move forward with implementation on a specified date.	Project Manager/DIRM IT Manager/DIRM IT Director	Implementation Approval (R)	• Business Owner

6.3.4 Implement Step

The purpose of the Implement Step is to conduct training, install solution, update state Application Portfolio Management (APM) tool, and close out effort. Close out efforts include identifying and documenting lessons learned and archiving effort documentation.

All deliverables and work products from the previous step must be complete and accepted prior to commencing work in the Implement Step. No migration to production can occur before the Business Owner officially signs off that the system as ready to implement.

The activities of the Implement Step are described in the table below. Deliverables/work products required for all efforts are denoted with an (R). All other deliverables are required as applicable to the scope of the effort and are denoted with an (S). DIRM Application Management teams are required to save all documentation (e.g., work products, test results, scanned signatures, etc.) related to the effort in the archive designated for the solution/effort.

NOTE:

DIRM Applications Management Team staff and designated approvers must use the configuration management process and tool to check out, check in, and move code to the appropriate library throughout the Build Step process. For more detail, refer to the Configuration Management Process in Appendix D.

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
1.	**Conduct Training**			
	• Conduct end user training, as appropriate. *DIRM Applications Management Team conducts technical training as appropriate.	Business Owner unless otherwise specified in the SOW and Detailed Schedule/Work Plan*	Training attendance list or appropriate training report and training surveys (S)	• N/A
2.	**Create Implementation Checklist**			
	• Create the Implementation Checklist as appropriate. This checklist ensures that all technical and functional required steps for migration to production are addressed.	DIRM Apps Mgmt Team	Implementation Checklist (R)	• DIRM IT Manager/ Project Manager
3.	**Install/Rollout Solution**			
	• Use the appropriate configuration management tool/process to move the code to the production library and promote the code/build/release to the production environment (see Appendix D).	Designated DIRM Apps Mgmt staff	Configuration Management tool history of approval and promotion of code/build/release (R)	• As designated for the configuration management process
4.	**Conduct Technical and Business Post Implementation Verification**			
	• Conduct technical post implementation review of the solution and completed Implementation Checklist to verify that all the appropriate production migration steps were successful.	DIRM Apps Mgmt Team	N/A	• DIRM Technical Lead

#	Activity	Owner	Deliverable/Work Product R = required S = scope dependent	Deliverable/Work Product Approvals
	• Conduct business post implementation review of production output (e.g., screens, reports, printed output, etc.; sample determined by business) within two business days of implementation or production execution, whichever is later.	Business Owner	N/A	• Business Owner to send notification to Project Manager/ DIRM IT Manager/ DIRM Technical Lead
5.	**Update APM**			
	• Create an entry in the state's Application Portfolio Management tool as appropriate for the solution as appropriate.	DIRM IT Manager	APM Tool (created) (S)	• N/A
6.	**Close out Effort**			
	• Review and document lessons learned.	Project Manager/DIRM Apps Mgmt Team	Lessons Learned (R)	• DIRM IT Manager/ Project Manager/ DIRM Technical Lead • Business Owner
	• Validate that all documentation, formal deliverables, handwritten notes, test results, etc. related to the effort in the archive designated for the solution/effort.	Project Manager/DIRM IT Manager or DIRM Technical Lead	N/A	• N/A

After the effort is closed out, the solution proceeds to the Operate Step for ongoing operations.

APPENDIX A. ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

Abbreviation / Acronym / Term	Definition
ACTS	Automated Collection Tracking System
APM	Applications Portfolio Management
BCP	Business Continuity Plan
COOP	Continuity of Operations Plan
COTS	Commercial-off-the-shelf
CR	Change Request
CSC	Customer Support Center
Data Conversion Testing	Technical testing performed to ensure that all data elements and historical data is converted from an old solution format to the new solution format.
DHHS	Department of Health and Human Services
DIRM	Division of Information Resource Management
DR	Disaster Recovery
ETL	Extract, transformation, load
IT	Information Technology
Interface Testing	Technical testing performed to ensure that the solution operates efficiently and effectively outside the solution boundary with all interfaced solutions.
ISO	Information Security Official
ITGC	Information Technology Governance Committee
LAN	Local Area Network
LDRPS	Living Disaster Recovery Planning System – the state repository for Business Continuity Plans.
NCID	North Carolina Identity Management
OITS	Office of Information Technology Services
Performance Testing	Automated technical testing performed to ensure that that the application performs to customer expectations regarding response time, availability, number of users, etc. according to the defined performance requirements.
PM	Project Manager
PPM	Project Portfolio Management
R	Required – in the context of deliverables required by the DIRM SDLC

Abbreviation / Acronym / Term	Definition
RACI	Responsible, Accountable, Consulted, Informed – a matrix used to denote responsibilities for deliverables and milestones for an effort
Regression Testing	Technical testing performed during system testing to ensure that that applied changes to the solution have not adversely affected previously tested functionality.
RTM	Requirements Traceability Matrix
S	Scope Dependent – Deliverables that are required if related activities are part of the effort (i.e., "in scope"). For example, if data conversion will be part of an enhancement or new development effort, the Data Conversion Plan is required.
SB991	Senate Bill 991
SCIO	State Chief Information Officer
Scope Dependent	A particular deliverable within the DIRM SDLC may not be necessary based on the content of the effort. For example, if an enhancement does not contain data conversion, a Data Conversion Plan and Data Mapping will not be required.
SDLC	System Development Life Cycle
SLA	Service Level Agreement
SOW	Statement of Work
SQL	Structured Query Language
System Testing	Technical testing in which all new or modified software elements, hardware elements, or both are combined and undergo beginning-to-end testing of a process impacted by solution change or development. The purpose of system testing is to ensure that design objectives have been met and ensures that the solution complies with operational requirements. System testing includes regression testing.
TASD	Technical Architecture System Design.
TCO	Total Cost of Ownership – The cost of developing a solution plus five years of operations and maintenance support.
TSS	Technical Support and Services
UAT	User Acceptance Test – Business testing conducted to determine whether a solution satisfies the acceptance criteria so that the Business Owner can determine whether to accept the solution. UAT is the responsibility of the Business Owner.
Unit Test	Technical testing performed to verify the implementation of the design for one software element (e.g., unit, module) or a collection of software elements. The purpose of component testing is to ensure that the program logic is complete and correct and ensuring that the component works as designed.

APPENDIX B. DIRM SDLC EFFORT TYPES

To apply the DIRM SDLC, the DIRM IT Manager must confirm whether the business request is a production incident (i.e., problem/interrupt) resolution, maintenance, or enhancement effort for a production application/system/solution, or a new development effort. This appendix supplies definitions of these effort types.

Production Incident Resolution

Production incident resolution is an effort to immediately correct a problem or interruption for an application and/or system/solution component.

An example of production incident resolution is the immediate correction of a problem to finish a batch cycle, but that may not address underlying data or system/solution problem, which would need to be addressed as a maintenance effort.

Maintenance

Maintenance is the process of supporting a production application and/or system/solution component after delivery to correct defects, maintain performance, and/or maintain compatibility with other elements in the technical environment to ensure that the existing system/solution and/or business functionality ultimately continues to operate as already designed. The maintenance of the application and/or component is not constrained by the time and/or size of the effort.

Examples of maintenance are as follows:

- Provide a long-term solution for an underlying data or system/solution problem that lead to a production interrupt(s).
- For COTS products, installing releases that provide patches or fixes to the system/solution.
- Move county code from one category to another.
- Update database to reassign case workload (i.e., from one worker number to another).
- Add and/or expand edits to validate further existing data fields.
- Correct a problem/error with an existing interface.
- Modify existing report (e.g., change report number, report header, increase field display characters). This only includes modifications that do not require changes to the report design.
- Modify existing form (e.g., change form number, form data, form headers, etc.). This only includes modifications that do not require changes to the form design.
- Modify tables, whether internal or external, to include new fiscal year changes within existing application design. Update batch programs or online screens that need changing to accommodate annual table changes if needed.
- Update an application program to replace a reference to an existing submodule that has been updated by an external stakeholder.
- Add edit to correct extract transformation load (ETL) process to prevent loading of duplicate data.
- Add or remove reference to value and associated program logic from modules (i.e., not decreasing or increasing functionality).
- Troubleshoot and correct application abends or infrastructure outages.
- Modify/add indices to maintain performance on the retrieval of data.

- Re-write structured query language (SQL) calls to maintain performance within an application.
- Provide assistance, direction, coordination, execution, development, and/or delivery of documentation, cross training, planning and data recovery tasks related to maintenance activities.

Enhancement Definition

An enhancement is the process of modifying an application and/or component/solution after delivery (i.e., after initial development and implementation) intended to increase or decrease functionality and capability from the existing design. The change and/or addition to functionality and capability are not constrained by time and/or size of the effort, however, these factors, along with risk, influence classification as either a major or minor enhancement. Large-scale enhancements might be identified by the DIRM IT Director for Applications Management or the DHHS Project Management Office as needing to follow the SCIO project portfolio management process.

Examples of an enhancement are as follows:

- Add functionality to enable end users to store addresses by a different grouping/category and provide new on-line capabilities so that state level end users can edit the addresses.
- For COTS products, installing upgrade releases that provide major updates that impact functionality.
- Add new funding types to application (i.e., that cannot be accomplished by adding entries to an existing application table) and requires modification or expansion to existing functionality.
- Add functionality that allows the end user to enter multiple adjustments to a previously entered amount that was originally designed for a single entry.
- Modify/add/remove data elements to screens, reports and forms.
- Modify/add a screen to allow end users to view or edit additional data.
- Create new report that is added to the production solution.
- Create a new form.
- Build a new system/solution interface and/or enhance an existing interface.
- Enhance functionality that retrieves and/or displays historical data.
- Enhance security features of a system/solution.
- Add and/or remove columns of an existing table used by an application, such as a demographics table.
- Modify functionality of an existing website to add and/or expand new categories, links, design, etc.
- Modify an existing database and/or application to accommodate a new data element, an expansion of length to an existing data element and/or removal of an existing data element.
- Enhance functionality of ad hoc special processes per agency requests.
- Add new tables or indices to a database because we are now tracking different data elements.
- Create utility jobs due to new set of databases and tables.
- Increase length of an existing data field and modify corresponding screens and reports.
- Provide assistance, direction, coordination, execution, development and/or delivery of documentation, cross training, planning, and data recovery tasks related to enhancement activities.

New Development

New development addresses the creation of a software solution that provides new automation for a business process, provides business relief and/or address a critical time-sensitive need. New development efforts that cost $100K or more to develop and maintain for five years must obtain approval by both the DHHS ITGC and the SCIO before DIRM can begin Plan activities.

Examples of new development include:

- Build a solution to replace a legacy system.
- Build a new solution to automate a business process.
- Build a Microsoft Access database to replace spreadsheets used to collect data.
- Build a solution that bridges between systems to provide data needed to meet a deadline.

APPENDIX C. MONITOR AND CONTROL ACTIVITIES

Monitor and control activities span the entire life cycle of the effort (i.e., Request Step through Implement Step) and include the following core activities and documents. All deliverables/work products must be completed and accepted in accordance with the defined acceptance criteria prior to closing out the effort. These activities and deliverables are typically performed by the DIRM Technical Lead/DIRM IT Manager or DHHS Project Manager (PM) if a PM has been assigned.

Logs and other effort specific tools used to perform monitor and control tasks are typically created during the Plan Step. Updates to these documents/logs are made in each SDLC step as appropriate to reflect the current state of the effort.

A consolidated deliverable/work product list for all effort categories is documented in Appendix E of the document. The consolidated list provides a description of the document content and the required deliverables for each effort type.

#	Activity	Owner	Deliverable/Work Product
1.	Timeline management – Ensure that the effort and deliverables are delivered on time, adjusting the schedule as necessary to accommodate approved changes. All enhancement and new development efforts must have a Detailed Schedule/Work Plan. Major enhancement and new development efforts must use Microsoft Project to develop and maintain their Detailed Schedules/Work Plans.	Project Manager/DIRM IT Manager/ DIRM Technical Lead	Detailed Schedule/Work Plan
2.	Status reporting – Ensure that the Business Owner is informed of current effort status.	Project Manager/DIRM IT Manager/ DIRM Technical Lead	Effort Status Report
3.	Deliverables management – Ensure that deliverables are delivered, reviewed, and approved per the defined acceptance criteria. * Physical signatures are required on all approval documents and other pages/forms that require signature.	Project Manager/DIRM IT Manager/ DIRM Technical Lead	Deliverables Approval forms*
4.	Issues management – Document, track, and escalate issues related to the effort.	Project Manager/DIRM IT Manager/ DIRM Technical Lead	Monitor and Control Log – Issue Log tab
5.	Risk management – Document risks that could potentially impact effort progress or outcome. Document and follow risk mitigation strategies.	Project Manager/DIRM IT Manager/ DIRM Technical Lead	Monitor and Control Log – Risk Log tab

#	Activity	Owner	Deliverable/Work Product
6.	Change management – Document changes in effort scope, time, and/or cost and obtain the appropriate approvals. * Physical signatures are required on all Effort Change Request Forms. For changes with no scope, time and/or cost impact, document in help desk ticket for maintenance efforts, and in Monitor and Control Log for enhancements.	Project Manager/DIRM IT Manager/ DIRM Technical Lead	Monitor and Control Log – Change Log tab Change Request Form*
7.	Vendor management – Ensure that the appropriate contract administration communications and procedures are followed, and contracts are amended as appropriate.	DHHS Contract Administrator	Amended contract
8.	Execute Service Level Agreements (SLAs) with all parties as appropriate and according to the timeline for ongoing support provided for the solution.	DIRM IT Manager/Project Manager	Service Level Agreement(s)
9.	Configuration management – Ensure that the appropriate procedures are used by DIRM Applications Management staff to check out/in, comment, approve, and promote to test and production changes to code/modules. See Appendix D for more information on required procedures based on technology used for the solution.	DIRM IT manager	Configuration Management tool history

APPENDIX D. CONFIGURATION MANAGEMENT PROCESS

The DIRM IT manager is responsible for ensuring that all DIRM application support team staff follow the defined DIRM configuration management process for the solution platform. The DIRM configuration management processes are as following:

- **Mainframe systems/solutions** use Endevor for configuration management. Procedures are located at: http://ncdhhs.gov/dirm/team51/endevor/.
- **The Automated Collections and Tracking System (ACTS)**, the Child Support Enforcement system, is written in Telon and utilizes a customized tool for configuration management. Telon procedures are located in the 00 SDLC\Config_Mgmt directory on the DIRM Policy drive.
- **Local area network (LAN) based, distributed, and web applications/systems** use Subversion for configuration management. Procedures are located at: http://ncdhhs.gov/dirm/team51/subversion/.
- **Commercial-off-the-shelf (COTS) solutions:** COTS software that is maintained by the vendor is not managed using the DIRM configuration management tools. However, any reports or add-on software to the COTS solution that is maintained by DIRM is required to use the appropriate DIRM configuration management tool.

APPENDIX E. DIRM SDLC DELIVERABLES/ WORK PRODUCTS

The following table provides a list of required and conditional deliverables and indicates which are required for each effort type. Deliverables/work products that are required for an effort type are denoted with an (R). All deliverables required as applicable to the scope an effort type are denoted with an (S).

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Request Step								
Help Desk Ticket	Documents the request and effort outcome. Can be opened by a Business Requester or DIRM as appropriate.	R	R	R	R	R	R	R
DIRM Enhancement Request Form	Provided by the business, documents the enhancement request and approval by Business Requester and DIRM Budget Officer.				R	R		
ITGC Request to Pursue New and the ITGC Application Budget Supplement	Documents the scope of the request as presented to the DHHS IT Governance Committee for approval. *Required if the Total Cost of Ownership (implementation costs plus five years of operations and maintenance costs) is ≥ $100K.						R*	R*
ITGC Memorandum of Approval	Documents ITGC approval of a proposed new development effort. *Required if TCO for solution is ≥ $100K.						R*	R*
DIRM SDLC Risk Evaluator Tool Results	Documents the results of the risk evaluation conducted for the effort.		R	R	R	R	R	R

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Plan Step								
SCIO PPM Deliverables/Reporting per TCO	Deliverables and status reporting as required by the SCIO PPM Process. *Required if the effort is required to follow the SCIO PPM Process.					S*	S*	S*
Detailed Business Requirements Document	Developed by the business, describes the business need, business needs/functions, training, end user documentation (e.g., System must address HIPAA requirements. Convert data from legacy system to the new system) requirements.		R	R	R	R	R	R
Technical Requirements Document	Additional requirements that will not be addressed by the business, or in the programming specifications. Examples include: • Operational requirements • Data requirements • Security requirements • System Interfaces requirements • Disaster recovery requirements • Hardware requirements • Software requirements * For maintenance and minor enhancements, DIRM IT Manager may determine that technical requirements can be documented in the SOW.		S*	S*	S*	S	S	S

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Requirements Traceability Matrix (RTM)	Maps functional requirements to design document; programming specifications/ detailed design; reports; forms, interfaces; test cases; and test, delivery, and implementation status. *Required for enhancements if an RTM has already been documented for production solution.		S	S	R*	R*	R	R
Statement of Work (SOW)/ Simplified SOW	Describes the scope, technical areas impacted by the effort, communications expectations and effort stakeholders, list of deliverables and acceptance criteria, high-level timeline, resource and cost estimates, target implementation date, roles and responsibilities (includes reference to DIRM Responsible, Accountable, Consulted, Informed (RACI) matrix for all Applications Management efforts), and assumptions and constraints. Documents approval to proceed with the effort. *Uses the Simplified SOW template.		R*	R*	R*	R	R	R

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Detailed Schedule/Work Plan	Defines all tasks, milestones, deliverables, associated interdependencies, resource availability, and task resource assignments. No template is provided for this deliverable as the details are unique to the scope and nature of the individual effort. * Use of Microsoft Project is required for major enhancements and new development efforts.				R	R*	R*	R*
Effort Status Report	Documents current status on the effort for the business, to include at a minimum: tasks completed in cycle, tasks planned next cycle, issues, and risks. Biweekly reporting is recommended unless another schedule is negotiated with the business.		R	R	R	R	R	R
Deliverable Approval Form	Documents signatures indicating approval and acceptance of the deliverable. Used for all DIRM deliverables. Physical signatures are required on all deliverable approvals.		R	R	R	R	R	R
Monitor and Control Log(s)	Tracks issues, risks, change requests (minimum change tracking tool is provided in this log; can be replaced with a more detailed tracking tool), solution defects identified for the effort. * Efforts that report to the State CIO use the state's PPM process.		S	S	S	S*	S	S*

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Change Requests	As needed, documents information about changes to the effort scope, schedule or cost to include a unique identifier, the date submitted, the Priority for change, the Requestor and the description of the change. Use the Change Request form (and update the Monitor and Control Log) to document changes that impact the scope, timeline, and/or budget of the effort. For changes with no scope, timeline, or budget impact, document the change on the Change Request Log tab of the Monitor and Control Log. Physical signatures are required on all Change Request Forms. The DIRM IT Manager or DIRM Technical Lead must perform an impact analysis that includes updating deliverables appropriately and repeating the DIRM SDLC Risk Evaluator if the CR includes a change in scope.* For maintenance, document in the help desk ticket.		S*	S*	S	S	S	S
Amended Contracts	Revisions to contracts to document agreed upon changes in contract terms, including, but not limited to, services and products provided, contract duration, and cost.		S	S	S	S	S	S

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Service Level Agreement (SLA)	Documents the level of service expected by DIRM from a vendor provider of IT services such as hosting, technical support, etc. The agreement lays out the metrics by which that service is measured, and the remedies or penalties, if any, should the agreed-upon levels not be achieved. May be two- or three-party agreements, and will be finalized in accordance with the Detailed Schedule/Work Plan for the effort. When finalized, this document is to be stored in the DIRM Vendor Management section.						S	S
Technical Architecture and System Design Document	A solution architecture design document required by the state for large-scale enhancements and new development efforts that both must report to the SCIO and have a Total Cost of Ownership of $500K or more. The template is available here.					S	S	R
Detailed Design Document	Describes the system requirements, operating environment, system and subsystem architecture, files and, input formats, output layouts, human-machine interfaces, detailed design, processing logic, and external interfaces. The detailed design for the solution must comply with the Statewide Information Security Manual.				R	R	R	R

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Data Dictionary	Documents the database data elements. Can be auto generated. *Update if necessary and the Data Dictionary has already been documented for production solution.		S*	S*	S	S	R	R
Data Mapping	Documents how data will be converted from one solution to another solution. *Update if necessary and the Data Mapping has already been documented for production solution.		S*	S*	S	S	S	S
Programming Specifications	Describes in technical detail the assigned programmer needs to code the solution or code changes to the existing production solution. Programming specifications must comply with the Statewide Information Security Manual. *Required if effort involves modifying code.		S*	S*	R	R	R	R
Linux Service Account Linux User ID; Server Farm Request OITS Hosting Services – New Project/Server Client Questionnaire, Solaris/AIX OITS Hosting Services – New Project/Server Client Questionnaire OITS Server Farm Request OITS Server Farm Request Form Other OITS forms as appropriate (S)	Documents requests to procure and/or implement hardware, server side software, or other IT infrastructure needed to implement the effort. Required if OITS supported new hardware and/or infrastructure/programming related software tools, and/or third-party software are in scope for the effort. *For new development, a hosting exception must be approved by the SCIO if the solution will not be hosted by the state.	S	S	S	S	S	R*	R*

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Appropriate Applications Integration to NCID form	Documents effort to integrate NCID with an existing or new solution that requires user login. *When NCID is required, an exception for integration with NCID for authentication and authorization must be approved by the SCIO.				S	S	S	R*
Security Plan	Details the types of security required for the system based on the type of information being processed and the degree of protection/ confidentiality needed. Documented and maintained by the Business Information Security Official (i.e., ISO for the Business Division that owns the solution). Store in secure part of archive designated for the solution.				S	S	R	R
Data Conversion Plan	Describes the strategies involved in converting data from an existing system or manual process to another hardware or software environment. Required if data conversion is in scope for the effort.				S	S	S	S

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Test Plan • Unit Testing (R) • System and Regression Testing (R) • Interface Testing (S) • Data Conversion Testing (S) • Security Testing (S for maintenance and enhancements; R for new development) • Performance Testing (i.e., including load and stress) (S) • User Acceptance Testing (UAT) (R – plan only; deliverables from UAT are the responsibility of the Business Owner)	Documents the testing strategy for each technical and business testing category that aligns with the scope of the effort. Also documents the testing strategy for identified security components/ requirements. The Test Plan is a strategic document that is required for the solution and is used to govern testing for all efforts, including new development. The plan is a required document, and once created, will be updated whenever an effort results in a change to the overall testing strategy for the solution.		R	R	R	R	R	R
Implementation Plan/ Simplified Implementation Plan	Defines the approach to rollout the system once it has been developed and fully tested. Includes contingency/rollback plans. * Uses the Simplified Implementation Plan template.				R*	R*	R	R
Training Plan	Documents the target audience, types of training to be conducted, approach for each type of training, and training roles and responsibilities. Updated/created by business unless assigned to DIRM in SOW and Detailed Schedule/Work Plan.				S	S	S	S

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Technical Test Cases (except UAT) • Unit Testing (R) • System and Regression Testing (R) • Interface Testing (S) • Data Conversion Testing (S) • Security Testing (S – maintenance and enhancement; R – new development) • Performance Testing (S)	Describes an input, action, or event and an expected response to that input, action, or event, to determine if a feature of a software application is working correctly for each testing category defined in the test plan. Includes security testing results as appropriate. Documents expected results and later updated to capture test findings. Store in secure part of archive designated for the solution. * Required if changes are to be made to the code.		R*	R*	R	R	R	R
Automated Test Scripts	Automated test cases used to conduct testing. Required where appropriate for the testing category and test case.		S	S	S	S	S	S
Build Step								
Installed Hardware/Server Side Software	Requested hardware, server side software and/or NCID integration is installed as needed to implement the effort.	S	S	S	S	S	S	S
NCID Integration	Solution is integrated with NCID as needed to implement the effort.				S	S	S	S
Solution Code	Development of a new or updated solution.	S	S	S	R	R	R	R

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Unit Test Findings/Results	An update to the Technical Test Cases deliverable, documents executed unit test findings. Store in secure part of archive designated for the solution. * Required if changes are to be made to the code.		R*	R*	R	R	R	R
Peer Review Checklist	Describes the results of a formal peer review of coding/configuration performed to implement the effort. Used for quality assurance and cross-training purposes. Recommended if coding/configuration is in scope for the effort. DIRM has provided a list of suggested areas that can be used when performing code reviews. Adapt as appropriate for the review being conducted.		S	S	S	S	S	S
Technical Test Findings/ Results • System and Regression Testing (R) • Interface Testing (S) • Data Conversion Testing (S) • Security Testing (S for maintenance and enhancements; R for new development) • Performance Testing (S)	An update to the Technical Test Cases deliverable, documents the findings of the executed tests. Store in secure part of archive designated for the solution. * Required if changes are to be made to the code.		R*	R*	R	R	R	R

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Configuration Management tool history of approval and promotion of code/build/release to test environment(s)	Documents formal approval to promote as well as the promotion of code/build/release to the test environment(s) (i.e., test and UAT as applicable).	S	R	R	R	R	R	R
User Acceptance Test Problem Report Log	Documents test findings/problems identified by the Business UAT Team during User Acceptance Testing; DIRM assignment, resolution; system testing results; and results of UAT retest through resolution. Store in secure part of archive designated for the solution. * Required if changes are to be made to the code.		R*	R*	R	R	R	R
UAT Approval Form	Completed by the business, provides formal user acceptance of the solution or change to the solution.		R	R	R	R	R	R
Disaster Recovery (DR) Plan	Describes the strategy and procedures used to back up and recover the system if necessary. Store in secure part of archive designated for the solution. Required for new development. *Required for enhancements if coding changes impact existing disaster recovery procedures or if DR procedures are needed for a production system.				S*	S*	R	R

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Training Manual/Materials	Any printed and displayed material used to train the end user and/or technical staff. The Business Owner typically performs training and develops training materials. Required if DIRM delivery of training is in scope for the effort as specified in the SOW.				S	S	S	S
User Manual	Any printed and displayed material that explains an application to the end user and system administrator. The Business Owner typically updates/develops the User Manual. Required if DIRM delivery of user materials is in scope for the effort as specified in the SOW.				S	S	S	S
Online Help Content	Any documentation that displays within the technical solution to explain the use of the solution (e.g., an application) to the end user. The Business Owner typically updates/develops the content of the Online Help, unless otherwise specified in the SOW.				S	S	S	S
System Documentation	Technical documentation that describes the system or support procedures				S	S	S	S
Implementation Approval	Documents formal approval from the Business Owner that all requirements have been met for the Build Step and that the effort can proceed to the Implement Step. Includes the date on which the solution will be implemented.		R	R	R	R	R	R

Deliverables/Work Products	Description	R = Required S= Scope Dependent						
		Production Incident	Minor Maintenance	Major Maintenance	Minor Enhancement	Major Enhancement	Minor New Development	Major New Development
Implement Step								
Training attendance list	Documents the attendees of training to signify that the training was delivered. The Business Owner typically performs training. Required if DIRM delivery of training is in scope for the effort as specified in the SOW.				S	S	S	S
Implementation Checklist	Provides a list of tasks that must be accomplished to correctly implement the solution into the production environment.		R	R	R	R	R	R
Configuration Management tool history of approval and promotion of code/build/release to production	Documents formal approval to promote and the promotion of code/build/release to the production environment.	S	R	R	R	R	R	R
Implementation Checklist (completed)	Verifies that the solution release was implemented using the approved sequence of activities.		S	S	R	R	R	R
Application Portfolio Management Tool Updates	Documents information needed to manage the state's Application Portfolio. *Required if there are any changes to information entered about the solution. For new development, required per state's requirements for the APM.		S*	S*	S*	S*	S	S
Lessons Learned	A review of the effort to identify successful and challenging aspects of the effort.						R	R

****End of Document****